DOCUMENT RESUME

ED 252 958 EA 017 469

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TITLE	The Generalisation of Educational Innovations: The Administrator's Perspective. Contributions to a Workshop Held at the International Institute for Educational Planning (Paris, France, December 8-10, 1980).
INSTITUTION	United Nations Educational, Scientific, and Cultural Organization, Paris (France). International Inst. for Educational Planning.
PUB DATE	83
NOTE	222p.
AVAILABLE FROM	Publication Sales, International Institute for Educational Planning, 7-9 rue Eugene-Delacroix, 75116 Paris, France (Order No. F.83; 10.00 francs).
PUB TYPE	Viewpoints (120) -- Collected Works - Conference Proceedings (021) -- Reports - Research/Technical (143)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Administrative Organization; *Administrative Problems; Administrator Role; Adoption (Ideas); Case Studies; Developing Nations; Diffusion (Communication); *Educational Change; *Educational Innovation; Educational Research; Elementary Secondary Education; Foreign Countries; Information Dissemination; Models; *National Programs; Planning; *Program Implementation
IDENTIFIERS	Ghana; International Institute for Educational Planning; Malaysia; ORACLE Formula; Peru

ABSTRACT

Twelve papers were presented at a 1980 International Institute for Educational Planning (IIEP) workshop on the generalization of educational innovations from the local to the national level. Six of these papers are published in this report, along with a substantial bibliography and an introductory chapter summarizing the papers and describing the discussion evoked by their presentation. The first paper, by Ramond S. Adams, places the workshop's subject in the context of the findings of an IIEP research study of the innovation process in seven countries. Thierry Malan's paper analyzes administrative problems caused by attempts to generalize innovations. Ronald G. Havelock and A. M. Huberman present ORACLE, a model for innovation generalization incorporating six factors: the object of the innovation, resources, authority, consensus, linkages, and the environment. The other three papers present case studies. N. O. Anim discusses the shift in Ghana from a British-style, humanities-oriented education to a practical, science-based curriculum. Administrative problems encountered during Peru's education reforms of 1972 are considered in a paper by that country's Centre for Education Research and Development. The final paper, by Dato Jai Salah Ahmed, describes an experimental program in integrated curriculum in Malaysia's primary grades. (PGD)

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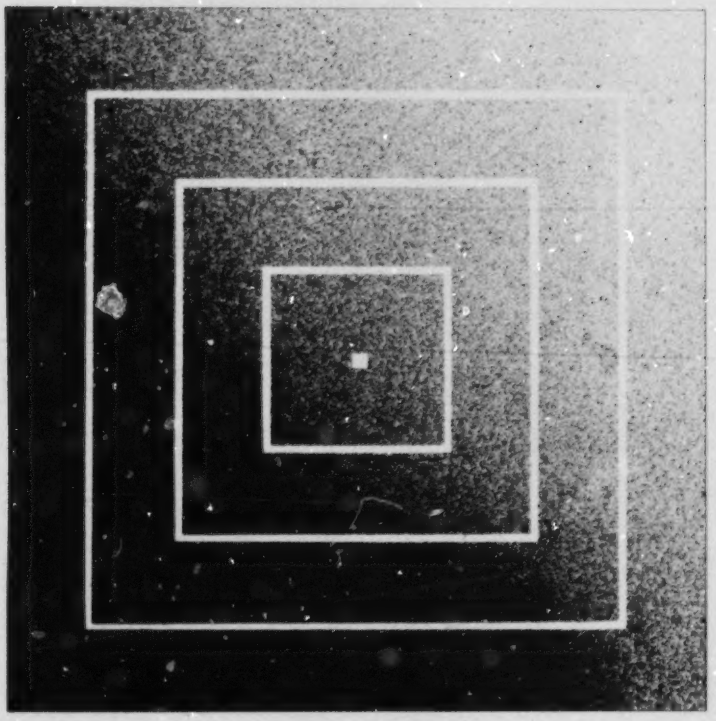
The generalisation of educational innovations: the administrator's perspective

An IIEP seminar



prepared by
Carlos Malpica
with the
co-operation of
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EA 017 469

International Institute for Educational Planning
(established within the framework of Unesco)

The generalisation of educational innovations: the administrator's perspective

Contributions to a workshop
held at the International Institute
for Educational Planning,
8-10 December 1980

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(established by Unesco)

Composition and make-up by IIEP
7-9, rue Eugène-Delacroix, 75116 Paris
December 1983

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FOREWORD

The present volume on "The generalisation of educational innovations: the administrator's perspective" is based on the conclusions discussed in an international workshop held at the IIEP in December 1980. The Workshop was attended by representatives of six out of the seven national teams of specialists who had cooperated in an IIEP research project "Planning Qualitative Innovations in Education" ("PQIE") begun in 1977 and completed in 1979. In addition representatives from three other developing countries having significant experiences in large-scale educational innovations also attended the workshop.

We have included in this volume three background studies especially prepared for the Workshop by Messrs. R. Adams, former IIEP staff member responsible for the "PQIE" project, T. Malan, (specialist in educational administration and head of the Planning Bureau of the Ministry of Education in France), and R. Havelock and M. Huberman (USA), authors of analyses in the field of educational change and innovation in developing countries.

In addition, three national case-studies have been selected as representing diverse experiences from distinct regions: Ghana, Peru and Malaysia. The first two relate to large-scale reforms and represent radical re-orientations: the first deals with "continuation" schools linked to employment, while the second relates to the improvement of the quality of education and administrative efficiency. The third case-study (Malaysia) is still in a pilot experimental phase and concerns curricular reform aimed at making education more relevant to the child's environment.

Experiences and studies on the administrative problems raised by the generalisation of educational innovations on a large-scale in developing countries shed new light on the complex inter-relationships which affect the practices of planning and management in different contexts. This is what was achieved during the Workshop, the deliberations of which were very enlightening and helped IIEP define further its research programme in the field of educational administration.

Foreword

An Introductory Note, written by Messrs. S. Rassekh (IIEP Consultant) and T. Malan (General Rapporteur of the Workshop) provides a general conceptual introduction to the theme, gives a summary of the papers included in the second part of the volume and presents readers with the main conclusions and suggestions drafted by the rapporteurs of the three working groups. This constitutes a valuable framework of reference for further thoughts on research needs and possibilities in a world where many educational development plans include significant innovations and/or large scale reforms.

Educational innovations and reforms vary in extent, nature and timing, and a discussion of concepts, strategies and techniques, should be of interest for decision-makers, planners, educationalists, administrators and scholars, who are all partners in policy-making and policy implementation processes.

This publication has been designed with such readers in mind. It is hoped that they will find in this collection of reports and individual studies not only background information and lessons from experience but also some conceptual orientation representing a contribution towards a theory of educational change, as well as proposals for further studies and reasearch. At the same time, it may prove itself useful as a practical guide for professionals in that it identifies actual practices, gives warnings and proposes strategies which take into account administrative constraints, barriers and even conflicts in the process of implementing educational innovations and reforms.

My colleague, Carlos Malpica was responsible for organising the above-mentioned Workshop, preparing this collection and providing the necessary orientation for the Bibliography, given in the third section of the volume, with the cooperation of Shapour Rassekh, IIEP Consultant and the support of the various units of the Institute.

Sylvain Lourié
Director

CONTENTS

	Page
Introductory Note by Thierry Malan Shapour Rassekh	3
Background Papers:	
The administration of reform: inferences drawn from the study of education innovations by R.S. Adams	35
Administrative problems in the generalization of innovations by T. Malan	68
Towards a theory of innovation generalization: Oracle, a six-factor formula by R. Havelock and M. Huberman	81
National Experiences:	
The Ghana experiment in continuation schools by N.O. Anim	137
Administrative problems encountered in the introduction of innovations in Peruvian Education through the Educational Reform of 1972 by CIPE (Centro de Investigacion y Promociòn Educativa)	153
The administration and organisation of curricular reforms in Malaysia: the integrated curriculum project by Dato Jai Saleh Ahmad	182
Selective Bibliography prepared by the Documentation Centre, IIEP	201

INTRODUCTORY NOTE

INTRODUCTORY NOTE

by Thierry Malan
Shapour Rassekh

I. Background and introduction to the theme

This volume is the outcome of an international workshop organised by the IIEP at the end of 1980, as a follow-up to a research project on "The planning of qualitative innovations in education" (PQIE). This project had been completed several months previously(1) and consisted of the phenomenological study of the innovation process in seven countries, beginning with their genesis, followed by development and testing of a relatively limited scope. It was natural that questions were raised as to the possibility of generalisation of these same innovations as large scale reforms and the problems that this would create for administration. Such questions were particularly pertinent since the IIEP had chosen the subject of educational reforms and their administration as one of the principal research themes in its 1979-83 Medium Term Plan.

This Workshop on "Administrative problems in the generalisation of an innovation as a large-scale educational reform" was attended by those responsible for case-studies of the PQIE project, i.e. from Ghana and the Federal Republic of Germany (which concerned in particular the problem of students at the end of their compulsory schooling period whose employment prospects were poor); from Indonesia and Malaysia (on the reform of content and study programmes); from Sierra Leone (on the reform of teaching and teacher training with a view to adapting them to the needs of the local community and rural development) and finally from New Zealand (which covered a reform aiming at effectiing a change in teaching methods and student

(1) The research project culminated in the publication of a work by R. Adams and D. Chen entitled "The process of educational innovation - an international perspective" Paris, Kogan Page Ltd./Unesco, 1981.

attitudes by a new type of school building). In addition, representatives from three other countries took part and presented new case studies:

- Peru, on administrative problems of educational innovations in Peru since the 1972 reform;
- Bangladesh, on a crash programme of mass education;
- Botswana, on two-level training in the University of Botswana.

The preparatory documents of the Workshop in the main touched upon the following questions:

(a) What were the administrative arrangements (structures, procedures, etc.) which were adopted for the implementation of the small-scale or pilot project?

(b) What were the administrative arrangements for the generalisation of the project?

(c) What administrative problems and deficiencies were encountered in the course of generalisation and solutions adopted?

(d) What changes had to be introduced in the project in order for it to be generalised?

(e) Were any systematic methods used to monitor the implementation of the reform, i.e. a formative evaluation and feedback system built into the generalisation process?

(f) Experience gained: What lessons have been learned which might be useful for other countries in a similar situation who wish to generalise an educational innovation or reform?

Discussions centred around three themes:

(a) What are the pre-conditions required for generalisation of an innovation?

(b) What are the barriers which inhibit generalisation of an innovation?

(c) What solutions and strategies are available for administrative action to ensure appropriate pre-conditions and overcome barriers?

A dozen papers were presented at the Workshop, of which six have been selected for this volume, three having a theoretical orientation and

the other three being case-studies. Thus the first part of the volume is composed of contributions by Messrs. R. Adams, T. Malan and Havelock and Huberman. The second part consists of the three case-studies carried out in Ghana, Malaysia and Peru.

As stated in the theoretical papers in the first part, in spite of the abundance of studies on innovations as well as on educational reforms(1), research on the way that the former are transformed into the latter (i.e. the generalisation of an innovation as a large scale reform) is relatively rare. In seeking the explanation for such an oversight, two questions must necessarily be asked:

- What definitions should be given to the terms innovation and reform?
- What strategies may be adopted in the domain of educational change?

As concerns the first question, it seems that reform cannot be defined in the majority of cases as the generalisation of an innovation. Richard Sack (in his article on "A typology of educational reforms" in Prospects, Vol. XI, No. 1, 1981) is justified, in our opinion, in making three distinctions between reform and innovation:

(a) Reform is an action undertaken at the level of the educational system of a country;

(b) It often makes reference to non-educational considerations, such as economic development, equality of opportunity, etc.;

(c) In addition, the initiative for a reform is generally taken by the decision centre of the system (political or administrative).

As opposed to the above, educational innovations must be considered in a more limited context, as more isolated efforts to improve or change certain aspects of the educational process(2).

(1) For studies of innovation, reference may be made to the numerous studies undertaken and published by IBE and OECD-CERI. As to studies of reform, work by Unesco and IIEP has been in the vanguard.

(2) What the economist Joseph Schumpeter has said in his "Theory of Economic Development" in regard to economic innovation (any change knowingly introduced by any agent and having as objective the more efficient and satisfactory utilisation of resources) applies more or less closely to the case of educational innovation. (.../)

Thus, if between a reform and innovation there is a difference of nature rather than just of extent, it is necessary to admit that a reform is not a simple generalisation of an innovation and that consequently, the transformation of one into the other is neither direct nor automatic.

As to the strategy adopted for educational change, it is known that the majority of reforms in developing countries have not been preceded by the much respected "research, development, diffusion (RDD)" strategy. This brings us to consider an additional problem in this field, which stems from the vague and ambiguous character of the terms employed to designate the propagation and spread of new ideas, new practices and new organisations. The word dissemination (research-development-dissemination) is more widely used for the propagation of information as concerns an innovation. This meaning, particularly useful in the case of the application of a "rational-empirical" model, only presents one aspect of the entire concept of generalisation. It is normal to envisage in any generalisation effort, the "distribution of information on the innovation it is desired to introduce to interested persons, particularly to specialists" (this is the definition of dissemination), but it is by no means certain that this procedure is followed in all cases of generalisation decided upon by the upper levels of the hierarchy.

As to the word diffusion, it is in current usage in anthropology and other social sciences. The diffusion of a model from one area of civilisation (or of society) to another is the subject of study by anthropologists, one of whom, Alfred Kroeber, has distinguished diffusion by contact from diffusion by stimulation. Generalisation, however, often goes further than diffusion - it can be the simple imposition of an innovative model but it always involves dimensions of intention and purpose that are not always to be found in diffusion.

The "Dictionary of Education", edited by Carter V. Good (New York, McGraw Hill, 1973) defines diffusion as an adoption process - the authors of this dictionary consider that the latter is composed of five phases: awareness, interest, evaluation, trial and lastly adoption in the restricted sense of the word. In a certain number of cases, particularly in the most

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(continued)
The five types of innovation distinguished by Schumpeter (new product, method, organisation, outlet or source) can also be applied in the domain of education.

developed countries, generalisation of innovations proceeds more or less in this manner. However, it must be said, in order to avoid any misunderstanding, that it is not rare to encounter this RDD strategy in the Third World also - one of the authors was involved in generalisation of tribal mobile or transhumant education in Iran after having noted the success of this new formula in experimental projects carried out in the Shiraz region (Fars).

But as noted by two authors in this volume, Thierry Malan and Raymond Adams, in developing countries innovations tend to be introduced in response to prevailing political pressures rather than as the outcome of systematic testing and evaluation, and are pro-active rather than reactive, i.e. they are directed to assisting social and economic changes and thus tend to be imposed by the political power and follow prototypes of reforms instituted elsewhere. Generalisation strategies can thus take many forms and depart radically from the original innovative idea. Here it should be mentioned that generalisation is a term which can be adapted quite well to various approaches, i.e. the power/coercive, the rational-empirical and the normative-re-educative, but it will not mean exactly the same thing in all contexts. This is why the term generalisation has been preferred to other terms such as dissemination, diffusion or even propagation (to propagate means above all to spread information, while here the concern is mainly with the expansion of a project or programme).

It can be seen that there are a great variety of educational reform situations. Sometimes they begin with an innovative idea (for example, the introduction of productive work in schools) and pass directly to generalisation on the decision of the central power (e.g. Zambia). Generalisation cannot always wait for verification from concrete experience, in particular certain African experiences(1) have shown that the detailed results of the evaluation of an innovative project have not been examined and implications discussed before proceeding to generalisation. It will be seen further on in this volume that Ghana, which had begun with a pilot project on post-school practical training, was obliged to rapidly generalise this innovation before finishing an in-depth evaluation because of social and political pressures. Another example of a difficult and thorny passage from innovation to reform is found in the case of Malaysia, also given in this publication.

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(1) See A.R. Thompson, Education and Development in Africa London, MacMillan, 1981, p. 198.

The generalisation of educational innovations:
the administrator's perpsective

It is known that the generalisation of an innovation often necessitates a change in structures, functions and roles, administrative procedures, etc., but the experience of Malaysia shows that it is sometimes also necessary to cede a change of content of an innovation in order to facilitate its adaptation to the conditions of subsequent generalisation. Another situation is that of Peru which illustrates the difficulties experienced by educational administration in adapting its role and behaviour for the management of large scale innovations as part of an overall reform process.

Among the few studies which have been devoted to examining the process of diffusion of innovation (in general) that by E. Rogers and F. Shoemaker ("Communication of innovations; a cross-cultural approach", New York, Free Press, 1971) should be noted. The authors of this work consider that diffusion is a particular form of communication by which new ideas are transmitted and spread among members of a society. The four principal elements which have a role to play in this diffusion are:

(a) the innovation itself
(b) the channel(s) of communication
(c) the time element
(d) finally, the members of the society or social system concerned.

Rogers and Shoemaker quote an impressive number of researches in which certain regular tendencies of the effects of each of these elements may be seen. As to innovation itself, the researchers show that five characteristic attributes of innovation contribute to its adoption and subsequent diffusion - these are: perception of relative advantages; perception of compatibility of this innovation with the values, needs and past experience of members of the social system; absence of complexity (complex and difficult innovations are adopted more slowly); the possibility of personally verifying the new idea in one's own experience, and finally, the possibility of observing positive results obtained by other people.

To summarise, the authors define innovation as a new idea and diffusion as a particular form of communication, i.e. a process by which new ideas are spread among members of a social system. But sooner or later all new ideas are transmitted and it is, for these authors, a question of knowing who will adopt the new ideas first. Research has shown that these people are those who:

- are more exposed to means of public communication;
- are more exposed to channels of interpersonal communication;
- have a greater contact with agents of change;
- show less traditionalist and dogmatic attitudes;
- take less time to make a decision;
- perceive at a particular favourable time the five attributes of innovation listed above(1).

As to research studies on the diffusion or dissemination of innovations, only a few studies of a theoretical orientation are widely known. In this respect, much is owed to Havelock and Huberman who, together, devoted a work to the study of educational innovation in developing countries using the systems analysis method(2) and published several other books on the same theme(3). In the paper which they wrote for the IIEP Workshop, their first step was to put forward six factors whose presence or adequacy are considered important for the adoption and diffusion of an innovation. These factors, summarised under the "ORACLE" formula, are: object, resources, authority, consensus, linkage and environment. As to the object or substance of the innovation, Havelock and Huberman came to much the same conclusions as Rogers and Shoemaker, in this case underlining the importance of five factors: pertinence, promised benefits or advantages, demand on resources, degree of complexity and compatibility.

A more detailed list than ORACLE has been proposed by Michael Fullan in his recent work "The meaning of educational change"(4). A chapter of this book, devoted to the causes and process of adoption of educational change, enumerates the following ten factors as being positively associated with adoption:

(a) The type and quality of innovations

(b) Access to information

(c) Support of central administration in favour of change

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(1) The conclusions of the researches quoted by the authors are very much more numerous than those given in this introduction, where only the most pertinent to the subject matter have been quoted.

(2) Solving Educational Problems, Paris, UNESCO, 1978.

(3) See the bibliography in the paper included in this publication: particularly the work by Huberman "Understanding change in education".

(4) Published by the Ontario Institute for Studies in Education, 1982.

(d) Pressure by and support of teachers

(e) Presence of advisors and agents of change

(f) Pressure by or support of the community

(g) Availability of state or other funds

(h) New legislation or central policy (in favour of change)

(i) Innovation offers solutions to existing problems

(j) Benefits promised to bureaucracy as rewards for adoption

R. Adams and his collaborators (see footnote page 3) arrived at a more technical and less political list of elements considered essential in all phases of the innovation and diffusion process:

(a) Justification

(b) Clear definition of tasks to be accomplished

(c) Personnel

(d) Method, strategy or procedure to be followed

(e) Building and space

(f) Equipment

(g) Finance

(h) Time

(i) Programme or sequence of activities

(j) Social context

(k) Monitoring and evaluation

Such checklists are evidently useful for administrators responsible for the generalisation of educational innovations. It remains for researchers to verify the impact of the presence or absence, strength or weakness, of each of these factors in the process of innovation and diffusion. It is known that where there is a conflict of interests, consensus can never be wholly attained and it is therefore indispensable to measure, by concrete research, the degree of consensus below which the innovation cannot progress to subsequent stages of diffusion and consolidation.

The models which have just been rapidly examined do not show how the generalisation process is initiated. The second theoretical approach of Havelock and Huberman attempts to answer this question by considering four different ways in which generalisation is carried out in practice, i.e.

(a) alternative of grandeur in which there is strong political support but the chances of success are reduced due to low level of participation by interested persons and insufficient capacities and resources in the country;

(b) controlled expansion which, while taking into account the capacities of the country, does not always have the necessary flexibility to adapt to the vicissitudes of diffusion;

(c) Crusades which while based on the enthusiasm of political leaders as in the case of alternative of grandeur do not obtain the support of the population to any greater degree. Large quantities of resources are mobilised, sometimes to the detriment of other competitive projects which creates a certain amount of tension. In addition, it is not always certain that the campaign will be able to reach the most remote areas. It is also sometimes difficult to judge what is rhetoric and what is really practicable.

(d) Small scale and local with the hope of subsequent gradual diffusion by the setting of a good example.

II. Summary of theoretical papers and national experiences presented in this volume

Summaries of the content of papers are given here in order to provide the reader with an outline of the material on which the discussions and conclusions of the Workshop (Section III) are based.

The Administration of Reform: inferences drawn from the study of educational innovations

Raymond S. Adams placed the work of the meeting in the context of the preceding research on the PQIE project (mentioned on page 1). The theoretical framework of the project was provided mainly by three models of educational innovation put forward by Havelock & Huberman (1978), Dalin (1978) and Berg & Ostergren (1977) (references for works quoted here are given in the bibliography prepared by the IIEP Documentation Centre). Other recent research in the field of innovation and educational change has also shed further light on particular aspects, i.e. Dill & Friedman (1979) on change in higher education; Fullan & Pomfret (1977) on curriculum and teaching, and E.R. House (1979) who described a ten year perspective on innovation(1).

(1) House distinguishes three successive perspectives on innovation: a technological perspective characterised by the use of the research, development, diffusion (/...)

The PQIE project itself proposed an organic analogy in which the (education) system was seen to consist of a series of interlocking and mutually influential groups which, for the analogy's sake, were seen as sub-systems or cells. These cells, which contain designated individuals and undertake defined tasks, can be regarded as "territories". Both the cells and the individuals in them tend to protect their territories against intrusion from "aliens" whether those aliens are people or ideas - particularly ideas for change.

To appreciate the role of administration in the generalisation of an innovation, it is necessary to ask, when analysing the sources of ideas for reform, if administration can give rise to or protect mechanisms which allow the development of ideas susceptible of becoming innovations and then reforms, and how it may furnish the means to make these ideas acceptable to public opinion. The case-studies and research of the PQIE project have led to the formulation of a series of operating propositions relating to this question:

- The initial acceptance of an innovation is a function of the relevant power than can be marshalled in its support. The greater the relevant power, the greater the likelihood of acceptability.
- The initial acceptability of an innovation is a function of the extent to which, as a change, it is seen to threaten the power of existing groups. The less the perceived threat, the greater the acceptability.
- The initial acceptability of an innovation is a function of the extent to which the benefits expected to result are thought to be in excess of the costs entailed. The greater the benefits (relative to cost), the greater the likelihood of acceptance (and vice versa).

As a consequence, one of the roles of the administration would be to know how to negotiate acceptability of reform ideas, to ensure a smooth

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paradigm; a political perspective which gradually replaced it as sensitivity to inter-personal and political aspects of innovation increased, and finally a cultural perspective which takes the whole context into consideration, not just the technological and political dimensions of innovation.

introduction for it into the educational system, as well as its subsequent survival and growth.

The success or failure of an innovation depends on a series of factors for the analysis of which the PQIE project drew up the following sequence, stating that success is a function of the extent and quality of provision made for:

(a) convincing argument in support of the project;
(b) realistic and practical specification of the content of the task involved;
(c) mobilising personnel in sufficient quality and quantity;
(d) ensuring availability of appropriate buildings and equipment;
(e) establishing procedures to ensure the coherence of (a) to (d);
(f) realistic evaluation of costs involved;
(g) drawing up of a time-table adequately defined to coordinate all actions, and within the time set for implementation;
(h) effective analysis of a "critical path" through the system to ensure that contact with different social contexts will facilitate rather than inhibit progress;
(i) provision for evaluation of effects, which may be used for further development of the innovation.

All these factors should be taken into account during the course of the five phases identified by the PQIE project for the innovation process: (i) identification of a problem; (ii) specification of the solution; (iii) initial use or trial; (iv) implementation; (v) consolidation or rejection.

The transformation of innovations into large-scale reforms in the educational system poses a structural problem for administration: the procedures to improve and change a system are in some crucial respects different to those needed to maintain it. It is therefore improbable that existing administrative functions and structures will be adequate for the generalisation of an innovation unless deliberate measures are taken for this purpose; even then they risk being insufficient if the change is a large scale one. According to the findings of the PQIE project, the magnitude of the necessary administrative change depends on: (i) the degree of

reform needed; (ii) the extent to which any administrative provisions already exist for transforming innovations into reforms; (iii) the extent of flux in the social environment. Thus the project showed that educational systems of industrialised countries tended to adopt a reactive stance consisting of waiting for problems to emerge and then adjusting the system at the margin. In contrast, developing countries tended to adopt a pro-active stance and aim at large scale reforms, they are thus concerned with having a desired prototype towards which their systems can be directed.

Administrative problems in the generalisation of an innovation

Thierry Malan has analysed several aspects of the reactions of administrations confronted by problems of innovation. The expression "administrative bottlenecks" is frequently used to cover a variety of problems. Certain "bottlenecks" are due to the fact that administration reflects often contradictory pressures that the groups composing society exert in order to obtain their wishes: a "bottleneck" is then only the expression of a certain unstable equilibrium established between pressures which favour reform and those which oppose it. Other bottlenecks are to be found in administration's own organisation, in its inertia and its difficulties in adapting to new circumstances.

Administrations have the responsibility for making educational establishments function regularly, they are held responsible by public opinion for anything which interrupts this. Faced with innovations which risk destabilising the educational system, even if they bring improvements, and in a generalisation process which stretches over a long period, their tendency is to seek as quickly as possible to return to a new position of stability. They seek to establish simple and uniform rules, limiting the number of exceptional cases, so as to lighten the management load and to achieve a certain, at least formal, equality among users. They can also seek to bring the content of innovations closer to what they know already, to integrate them into their own traditions in order to avoid as far as possible any upsets to the system. In thus seeking to make innovations acceptable to the greatest number and simplifying their application, they ensure a certain foundation for them but at the same time run the risk of changing their nature.

The different actors in innovation and generalisation have different preoccupations and behaviour and their frameworks of reference, interests, priorities, rhythms of action, do not necessarily coincide. Between the politicians and administrators, national and local, innovators, heads of establishments, families and representatives of associations, certain influential relationships are established which modify the physionomy of reforms undertaken. The passage from the innovation stage to generalisation involves the interests of all the actors in the educational system including those who are opposed to the objectives of the reform. This implies at least that such resistances have to be overcome, even by obtaining a certain indifference. It is not possible to rely merely on a call for volunteers, other encouragements have to be found, either disciplinary or by giving material and statuory advantages while waiting for the reform to make its positive effects felt and thus acceptable to the majority.

The generalisation of an innovation is accompanied by increased need for information and training, not only of teachers but also of administrators. Local administrative capacities should be strengthened. A reform implies a certain redistribution of power between ministers, services, and levels of administration; time must be allowed for a new power equilibrium to appear and be considered by everyone as stable and normal.

The conditions of administration of innovations cannot be allowed to differ for too long from those of current administration. Generalisation involves the establishment of routines, stable procedures and the supply of resources (finance, staff, materials) which are not exceptional.

In order to avoid bottlenecks, particular care should be taken with the drawing up of the time-table of the reform and the temporary measures to ensure, during the intermediate period, the passage from the old to the new without too many shocks. Equally, new resources released for the reform should be made available for a sufficiently long period in order that the reform becomes part of the daily life of educational establishments. Sufficient coherence should be maintained between the supply of different resources: buildings, equipment, qualified personnel, current finance, in order to reduce the risk of under-employment of costly resources which may lead to scepticism and discouragement.

Finally, generalisation and the proper administration of innovation involves allowing adequate time: it is important to avoid situations where reforms are radically changed or even abandoned, before they have hardly begun to be assimilated or efficiently implemented at the local level.

Towards a theory of innovation generalisation: ORACLE - a six factor formula

On the basis of an analysis of a large number of cases, Ronald G. Havelock in collaboration with Micahel Huberman, has presented a model for innovation generalisation. The model is called ORACLE, using the initials of six themes:

O - Object of innovation
R - Resources
A - Authority
C - Consensus
L - Linkages
E - Environment

As opposed to the problem of the invention of an innovation which involves surmounting poverty of knowledge and suitable procedures, the problem of generalisation of innovation involves elaborating strategies for the implementation of innovations, for their support once launched, for motivating a general desire to adopt them and for using them effectively elsewhere. Each of the elements of the model has a number of dimensions:

O - Object of the innovation. It should correspond to the needs of the society concerned, bring tangible benefits and not arouse excessive hopes. It requires the mobilisation of resources and if these are rare, the transfer necessary for the benefit of the innovation will be to the detriment of other activities and will render the innovation more fragile if initial enthusiasm decreases. The degree of complexity of the innovation, both intrinsic and in its relations with different domains of society as well as in implementation conditions, is an important factor since greater levels of consensus and official endorsement will be required the greater the complexity.

R - Resources: finance, human and material. This aspect of the model seeks to determine the equilibria between internal and external resources, taking into account the time needed for their creation and employment and the need to avoid imbalances between different types of resources which could lead to their being badly utilised.

A - Authority. This aspect analyses the support given to innovation by legislative means or by political action, and the conditions for their efficacity and continuity at all levels of the political and administrative apparatus.

C - Consensus. This concerns the phenomena of redistribution of power between the different actors involved in the change. Power equalisation among the different members tends to dilute the magnitude of the change, e.g. local communities, if they are permitted, can divert resources provided for the innovation to more traditional activities which are more important to them. The model seeks to analyse the different types and levels of participation, and the risks run due either to greater or to too little participation.

L - Linkages. This covers all the problems, qualitative and quantitative, of the inter-relationships, structures, division of work and changes occurring to them when a civilisation evolves towards a more complex form, i.e. problems of infrastructure. If the infrastructure is stable, diversified and contains a great number of agents, roles, routines, procedures, models ... the innovation is likely to be of a larger scale and have more chance of success and continuity. Weak links in a society give a greater probability of "errors", of unforeseen events, which will impede the implementation of the innovation.

E - Environment, i.e. setting and major characteristics of society and their influence on innovation. Four of them are seen as particularly important:

- "openess", flexibility and receptivity to change;
- compatibility or consonance between the objectives of change agents and those of the larger system;
- synchronisation of change efforts with the rhythms of the receiving culture;
- turbulence in society, such as frequent changes of government, instability of tenure of administrative personnel, frequent shifts in public opinion, confusion and dissension as to the basic needs of society.

The ORACLE analysis gave the possibility to group the different case studies having similar characteristics into four theoretical models: (i) the alternative of grandeur; (ii) controlled expansion; (iii) the crusade; and (iv) small scale and local.

The ORACLE method gives in detail all the domains and operations which should be taken into account during the various phases of an innovation and its generalisation. It facilitates the analysis of any effort at change as a system and as a conflict between systems, each social

system being a more or less compact and structured ensemble of elements such as people, organisations, rules, resources. ORACLE therefore makes a contribution to the general theory of generalisation of innovations. This theory distinguishes the successive phases of the process of identification and solving of problems. It analyses the difficulties caused by the passage from one phase to the other and the omission of certain phases. It evaluates the importance of each of the themes of the ORACLE model during the different phases and analyses the phenomena of transition and communication which alter the features of the problem to be solved and necessitate the reformulation of both problem situations and envisaged solutions. A reform is an inter-system phenomenon which can be broken down into a series of time-transfer segments. Each segment of the series can be understood as an ensemble of the inter-active effects of the six themes of the ORACLE formula.

The Ghana experiment in continuation schools

In this paper, Mr. Anim shows how the Government set about changing the orientation of the education system which was previously based on the British model and had a strong bias towards the teaching of Humanities as opposed to the Sciences. It was desired to give education a more practical orientation to limit the numbers wishing to take up "white collar" professions in an urban environment and to reduce the extent of unemployment which had resulted from previous preferences for such occupations. The greatest number of drop-outs occurred at the end of primary school where the entrance examination to second cycle education allowed only 20,000 pupils out of 120,000 to continue their studies. The "continuation schools" programme is designed for the 100,000 who would normally leave school without any professional qualification and is aimed at orienting them towards practical training which may be used in a rural environment.

The pilot project was begun in 1970 in two schools in each of the nine regions for the 9th and 10th grades only. In 1980 it covered more than 1,200 schools for the four grades of middle school. The project was placed at the beginning under the direction of one officer, the project chief, in the headquarters of the Ghana Education Service but now has 9 Regional and 60 District Organisers and almost as many teachers as are appointed for the regular academic courses.

Difficulties were encountered in the supply of equipment for the schools due to its cost and in the lack of specialised teachers. Generalisation had to be undertaken earlier than foreseen for political reasons

since in a very diverse society it was necessary not to be seen to discriminate amongst regions and ethnic groups. The idea to carry out an in-depth evaluation before generalisation in 18 pilot schools had therefore to be dropped. However, an evaluation of a sample of pupils in 9 out of the 30 courses offered by 150 continuation schools in one of the regions was compared to a sample of pupils in schools of traditional middle cycle and it showed that the pupils in the former schools obtained paid employment more easily in the field of specialisation which they were taught and considered that they had derived more benefit from their training than the latter group.

The Government now intends to organise these courses as normal vocational and professional education in a 3 year cycle to replace middle school education. This subsequent development will necessitate, as seen by past experience, a major coordination effort with other Ministries.

Administrative problems encountered in the introduction of innovations in Peruvian education through the 1972 educational reform

The paper written by the Centre for Educational Research and Development, Lima, lists the four major facets of the 1972 Peruvian Educational Reform as (i) change of pedagogic and administrative structures; (ii) system of nuclearisation for the creation of educational districts; (iii) a plan for teacher training; and (iv) the design, production and distribution of new instructional materials.

In the implementation of this legislation and subsequent plans, the time-table fixed for the achievement of objectives had to be modified several times because of difficulties encountered in the mobilisation of financial and human resources. The official proclamation of target dates has a symbolic and political value but keeping to them involves knowing and mastering the resources to be mobilised and obstacles to be overcome.

Decentralisation and the creation of educational nuclei are policies which imply an increase of administrative resources of the educational system and therefore proportionately more expenditure devoted to administration from the total allocated to the reform than is usually the case for maintenance administration. In the experience of Peru, insufficient resources, particularly of qualified personnel, led after several years to a reduction in the number of nuclei. Teachers' salaries, as is normal, represented the largest item of expenditure, but errors in forecasting, particularly as regards the effects of anti-inflationary policy to freeze increases in

salaries, impeded implementation of plans since persistence of inflation made such implementation or even revision impossible to undertake.

The need to reinforce the operational capacity of structures and administration can be a considerable bottleneck even when financial resources are available: in this particular case investment expenditure never exceeded 70% of the authorised budget. Frequent changes of administrative staff represented a serious impediment to the establishment of institutions foreseen by the reform. The regionalisation policy represented by nuclei implied an acknowledgement of the cultural diversity of the country which often clashed with the habits of a tradition of centralisation. This led the central administration to seek to strictly limit the use made by nuclei authorities of their new autonomy in both administrative and pedagogical plans.

The programme of teacher training encountered various obstacles, e.g. teachers who had not yet benefitted from training sometimes adopted the attitude of a critical spectator in regard to the reform; teachers who had received training were in a position to know more about the new system of education than the heads of their own schools. This training, as well as the administrative reform aimed at giving more local autonomy, had not been linked to the definition of appropriate local study programmes, and the teachers continued to find that their pedagogical work was closely confined and defined by central regulations. Certain material resource problems also caused difficulties, e.g. delays in supply of materials foreseen for the various phases, delays in payment of salaries. This tended to reinforce the teachers' anxious or hostile attitudes to the Reform.

The preparation of manuals and other educational materials was also an element which caused tension between autonomous action and ability to take local diversity into account, and the tradition of centralisation. It was manifested, for example, by ideologic and methodological control of documents produced, particularly in the domain of the Humanities, and resulted in the creation of long approval procedures for documents and materials produced locally, not only as regards content but also as regards cost, possibilities for use elsewhere, etc. These procedures took time and demanded qualified personnel which resulted in many delays in the distribution of finished products to users in schools. Another factor causing delay was insufficient information in the administration on the real needs

of schools, giving rise to problems of stocks, delivery of excessive or insufficient quantities and delays in delivery.

The administration and organisation of curricular reforms in Malaysia

Mr. Saleh Ahmed describes the launching in 1974 of an experimental programme on an integrated curriculum for the first three years of primary education. It was designed to give an education based on the child's environment and cut across subject matter boundaries which traditionally exist between disciplines. In 1978, 22 schools were chosen as pilot schools and 7 others as experimental schools. The latter were to test the manuals and other pedagogical materials prepared for the project. Training courses were organised for the teachers in pilot schools. Generalisation cannot be envisaged until such time as sufficient support from the teachers is obtained. This will only be possible if the integrated curriculum does not appear artificial but results in a better relation between the theoretical and practical approach to subjects as well as being a sound foundation for the later cycles of education.

A particular difficulty was found in the need to give a sound education in three essential subject domains of primary education, i.e. reading, writing and arithmetic. In order to ensure this, the project evolved towards a "thematic" approach in which only a partial integration is achieved, limited to studies of the environment, elementary science, hygiene and practical work. This limitation of the initial ambitions of the project appeared necessary if it was to be subsequently generalised.

The system tried out leads teachers to cooperate, limits duplication and too rigid a separation of subjects taught, enforces a methodological effort to organise the periods of 80 - 120 minutes devoted to the four subjects of the integrated curriculum instead of successive sequences of 30 minutes for each. On the other hand, the role of the teacher becomes more difficult, the problems of organisation of time and classroom space and use of equipment are increased and necessitate training and support from the administration.

The success of the innovation appears particularly linked to the capacity of the system to maintain, through or in spite of the reform, an adequate quality of education in the three fundamental domains, and thus decisions on the generalisation of the innovation will have to be made with great caution.

III. Discussions and conclusions of the workshop

As stated on page 2, discussions centred around three themes. In respect to Theme 1, case-studies as well as the discussions emphasised various pre-conditions required for the generalisation of an innovation, the most important being seen as:

- precise definition of the objectives of the innovation; distribution of information on these objectives and its comprehension by all parties concerned;
- elaboration of a clear implementation strategy, detailing procedures and methods, and making a clear-cut distribution of functions and responsibilities;
- availability of sufficient and suitable resources: qualified personnel, physical infrastructure, equipment, finance, and guarantee of their continuity;
- initial training and orientation or reorientation of staff responsible;
- community participation in order that the population will appreciate the need for the innovation and perceive it as meeting their own needs;
- moral and practical commitment of the political authorities;
- establishment of an in-built monitoring and evaluation system;
- drawing up of a time-table for the different phases of the process - timing of the innovation is a decisive factor in ensuring success.

Discussion of Theme II, barriers to the generalisation of an innovation, was introduced by a short note written by Shapour Rassekh which gathered together and classified the obstacles to generalisation described in the case studies and other documents. In this note it was proposed that barriers which inhibit generalisation of an innovation should be discussed rather than barriers to innovation itself, because a great number of the barriers in the latter case, such as aversion to new ideas or methods, force of habit, feelings of insecurity, etc., are eliminated to a great extent when the decision to generalise an innovation is made by the respective authority. Discussions were oriented towards four categories(1) of barriers to the generalisation of an educational innovation:

(1) These four types of barriers correspond more or less to those recognised by P. Dalin ("Limits to Educational (/...)

(a) those related to attitudes of people or groups involved, and

(b) those stemming from the customs and value system existing in society

(c) organisational

(d) economic and financial

The Workshop emphasised the importance of certain aspects under each of these headings, first with reference to (a) and (b). Generalisation of innovations fail if people are not interested in them, do not think them worthwhile, lack or lose enthusiasm. The most important barriers seem to be related to human reactions of recipients and onlookers of a reform and of persons or groups involved in the work. If no enthusiasm is kindled, nothing will be set in motion. If too much enthusiasm is aroused, people expect too much, In the different phases of a reform, something like a "balance of enthusiasm" is necessary to get the desired result. The political leaders, the responsible administrators, must be interested in the reform. If their interest decreases during the reform process the innovation is in danger. The "workers in the field", the teachers, must be prepared, willing, and able for the implementation. There is always the danger of their relapsing into the routine, of their waiting for the reform to pass and be forgotten. The parents must be interested. In some cases there is a danger of the parents or the pupils losing interest because the hoped-for consequences of e.g. a new form of learning, of extended school-time, etc. do not materialise (e.g. they learned what they were expected to learn and nevertheless do not get the job they hoped for). This may happen even if the reform was implemented successfully, even because of its success.

If it is not possible to create enthusiasm for a reform in all groups of the people concerned, it seems important at least to diminish resistance - sometimes all that can be hoped for is that certain groups remain indifferent (e.g. trade unions, churches, parts of the press, etc.). In order to get them to tolerate the reform, it is important that they do not feel threatened in their economic, social or prestige interests. Very often people fear what they do not know or know incompletely. Therefore

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(continued)
Change" London, Macmillan, 1978) as being obstacles to educational change, i.e. value, power, practical and psychological barriers.

it seems necessary to explain clearly and often what the innovation is about, its aims, its chances, risks and costs. It is especially imperative to explain the need for the innovation if an educational reform tends to favour one section of a people (e.g. hitherto underprivileged classes). Incomplete information and empty promises endanger the reform - promises which cannot be fulfilled cause people to complain that the situation was very much better before the reform.

Ineffectiveness of administrative procedures may be a cause of the reform not succeeding, since if a smooth flow of information and communication between officials at all levels is not ensured, the lower levels of administration will just let reform-rhetoric flow over them while they continue to work as they always did.

A reform that implies a rupture in values, a departure from existing culture (a "cultural revolution"), seems only to have a chance of success in a revolutionary situation. Even then the culture tends to fall back to accustomed values. Even a relatively small alteration in values (e.g. newly introduced sex education, teaching of a national language in a multilingual society) causes resistance. People have to be shown that their value systems are not going to be entirely rejected but that there is a need to develop them in a particular direction - they must see the bridge between past and future.

There seems in this field to be a necessity to develop bargaining and negotiation procedures. The reform has better chances of success if people become involved in a process of participatory planning and learn to live with changed cultural forms. Some degree of enthusiasm and/or tolerance must accompany the reform until it has become routine, i.e. has become part of the accustomed system. Then it no longer has the appeal of a reform, but is part of the "natural state of things" as people see it - they then are prepared to defend it against the next reform.

The barriers related to infrastructure were widely discussed in the papers presented but in the debates of the Workshop, they seemed to assume less importance than the barriers related to persons, such as lack of interest.

Organisational barriers are, for example, lack of appropriate problem-solving routines, ineffectiveness of administrative structures, lack of coordination between people in different roles, departure of key personnel, lack of clarity in the distribution of responsibilities, disproportionate

development of bureaucracy absorbing time and resources, lack of clear decision-making structure, delays in formal authorisation, lack of skilled manpower may have been over-estimated as a barrier for it has been found that it can be offset to some extent if enough enthusiasm is aroused.

Economic and financial barriers are to be found in lack of rooms and equipment, and in lack of financial and material resources to procure them on time. Delay in delivery may cause serious trouble, long distance and slow transport in developing countries hampers effective work. High inflation rates in some countries have meant that previously estimated funds became insufficient. Care should be taken not to use up funds in the purchase of costly equipment since sometimes it has proved to be useless in practice. One of the most important consequences of the lack of funds is that it renders the administration unable to provide personnel with the necessary financial rewards.

The time-table seems to be important for a reform. Governments sometimes want all work to have been done yesterday - such haste is possible only if fierce enthusiasm has been kindled, otherwise it is damaging. On the other hand it seems dangerous to proceed too slowly - a reform, even a reform thoroughly planned step by step tends to lose support even among partisans. A middle way between haste and patience seems advisable.

As to solutions and strategies to ensure appropriate pre-conditions and overcome barriers, the Workshop drew up certain general considerations.

At the most general level the theories of social psychologist Kurt Lewin are seen to be quite useful, particularly his division of change strategies into three parts: "unfreezing", "moving", and "refreezing". Ultimately all three parts must be considered by the planners and administrators of reform, and each might suggest rather different strategies and tactics. Another Lewinian concept, that of the "force field" proposes that any reform can be analyzed in terms of a set of forces favouring the change and another set of forces opposing the change. Change strategists should always note the possibility that reform can be promoted either by increasing the favouring forces or decreasing the opposing forces. Again, each approach suggests rather different strategies and tactics at the operational level and both types may contribute to an effective overall reform effort.

Another general consideration is the level at which "strategy" is being discussed. At the broadest level is what might be called "strategic orientation" and among the various conference papers and presentations at

least four such orientations can be seen as follows:

(a) Political orientation: directed toward what can be done using political power, laws, and the active involvement of the highest levels of government.

(b) Administrative orientation: considering what can be done at the level of administrative organization and manipulation.

(c) Rational-empirical orientation: considering what can be done using the structured approaches of science and engineering.

(d) Participative-persuasive orientation: directed toward changes in beliefs, attitudes and behaviours through mutual consent and understanding.

Below the level of strategic orientation more specific consideration can be given to what strategic options are available in the long term, and within the long term what more specific strategic elements might be considered in the short term. At the most specific level there are what might be called "tactics", specific do's and don't's which apply to certain situations at a given point in time.

The first step in developing strategy is a diagnosis of the situation which presents itself at the time of action. Such a diagnosis should consider pre-conditions and barriers in terms of three critical elements:

(a) the innovation itself, including its benefits, costs, acceptability, etc.;

(b) the implementers of the reform, including their values, capacities, and readiness for change;

(c) the existing state of the environment or setting in which the innovation is to be inserted including a projection of future stability of such items as resources, manpower, and leadership support.

Referring specifically to political strategic orientations, at least four types of the strategies discussed belong under this category. The first and most dramatic is the "crash" programme involving the strongest and most insistent pressure from the country's leadership and the massing of resources and manpower on both a voluntary and involuntary basis towards a major social goal which is perceived to be achievable in a short time. This could be likened to the mobilization of national effort in war time.

While such a process can have dramatic positive results there are also dangers in (i) raising expectations; (b) underestimating the complexity of the task; and (iii) not considering the longer range problems of implementation, continuance of resources, maintenance of enthusiasm, etc.

At a less dramatic level, a strategic choice often seen as necessary or desirable is the acquisition of support, endorsement, and active involvement of political leadership at the highest levels, typically with the result that a law is established with various provisions which must be complied with at different levels of the educational system. It was pointed out that such a strategy may be necessary when it is assumed or ascertained that key persons to be affected by the reform, e.g. teachers, will resist. In this case legalizing the change process assures what Etzioni calls an "alienative involvement". The use of power to coerce a change effort may succeed in some situations and not in others, partly depending on the nature of the change which is called for: if the change has immediate and visible results which are mostly positive, resisters may change their minds; if the structural-behavioural supports for the old ways are removed, the change may be irreversible. If, on the other hand, these conditions do not hold, resistance may go underground to return when leadership changes or softens in its enthusiasm.

A third type of political strategy mentioned but not very far developed in the discussion was that of bargaining or brokering the change process in which political leadership is ambivalent or concerned about the maintenance of stability while promoting modest reform. Thus it concerns itself with tactics of compromise, mollifying antagonistic groups, and making modifications to the reform to render it more acceptable to one interest group or another.

Yet a fourth political strategy mentioned but not developed in the discussion is that of conflict or perhaps conflict management. In this approach, supporters of the change deliberately seek political power over opposing groups to bring about the reform; thus the reform is a stimulus to a change in the balance of power and presumably through some sort of dialectic process, the reform finally takes place.

As concerns strategic orientations of the <u>administrative</u> type, recognition was given in the discussion to the fact that a considerable amount of reform effort can take place at the administrative level without necessarily involving the top political leadership to any great extent.

A major consideration here is timing. There are only certain moments in the ongoing life of a culture when dramatic political moves are possible but it is incumbent on the administrative level to prepare for these moments long in advance and to continue with the reform long after they have passed. At least five alternative strategies could be grouped roughly in the "administrative" category.

One of these could be called "progressive implementation", exemplified by the diligent work of Peruvian administrators and educators to follow up on and implement the very ambitious law of 1972. In many cases adjustments and compromises need to be made to conform to the realities of the situation and to the changing political-social climate.

A second approach exemplified by the Indonesian case is the cascading reform in which components of the overall reform are added piece by piece and expanded somewhat in a snowball fashion.

A third administrative strategy could be called the "low profile", often typified by the development of a pilot project which allows the idea of the reform to be thoroughly tested prior to making it visible and prior to appealing to political leadership for major support. Whether or not pilot projects are undertaken, it was pointed out that administrative personnel should always be planning ahead for that future time when the political opportunity will present itself so that the leadership will have available reform designs and proposals which will be practical and effective in the long term.

A fourth type of strategy under this heading could merely be called "administrative changes", i.e. modifications in regulations, roles, and institutions which may have direct or indirect effects on various reform efforts. These might include the establishment of new types of schools, administrative levels, research and development centres, etc. This could be called infrastructure development.

A fifth type of change under this category could involve the changing of rewards and incentives, including the adjustment of salaries, the granting of status, etc. Such an approach might assume what Etzioni would call "calculative involvement" on the part of certain key groups, i.e. involvement conditioned largely on the extrinsic rewards for participating in the reform.

At least two approaches were mentioned which would fit into the rational-empirical category. The first was that of the experimental model, in which an innovation is developed, successively improved, tested and

scientifically evaluated against control situations using the best field research methods available. Such a process ensures the validity of the results of an innovation, assuming that the same conditions apply at the time of full generalization.

A second more general strategy in this category is that of emphasizing evaluation, both formative and summative, and the use of such evaluation data as feedback to decision-making as the reform progresses.

At several times during the workshop, mention was made of three aspects of change phenomena that relate to participative-persuasive strategies. First it was noted repeatedly that change in attidues and values was on the one hand the most difficult challenge for reform planners and on the other the most important task to be carried out. Secondly it was stated many times that the stubborn resistance of key persons, notably teachers, can undermine a reform effort in the long run. Thirdly it was frequently stressed that participation of the various levels was a major issue and a necessity for the generalisation of a reform. Three strategies could take these elements into account.

The first is training or retraining the various persons who will have to be involved in long-term implementation and routinization. Through intensive, well-designed and repeated training experienced key actors have a chance to understand fully the behavioural operational requirements of the reform and may also come to appreciate its benefits.

A second approach is the extensive use of media of various sorts to spread word of the reform, increasing awareness and, hopefully, also acceptance, understanding and even generating enthusiasm.

A third strategic alternative under this heading is the inducement of active social participation at various levels from the bottom to the top of the social political system. Participation of teachers and of top political leaders were both mentioned as being particularly crucial. The mechanics or specific tactics for inducing and managing such participation were not thoroughly discussed but it was noted that potentially resistive groups who acquire a proprietary feeling for a reform will be far more positive about its implementation. On the other hand, inviting participation also implies inviting modification of the reform itself and compromise among the interest groups which participate.

The workshop finally considered possible combinations to construct an optimal strategy. The wisest course in selecting a strategy will

depend on a full diagnosis of pre-conditions, barriers, and the innovation itself, as stated earlier. Given the complexity of most reform situations, it would then seem unlikely that the best overall strategy would be one which doggedly stuck to any of the above alternatives. Rather it would appear that a mix would be appropriate, and a mix which would change as the situation developed. For example, it would usually seem appropriate to include some empirical-rational elements as part of an overall administrative approach. It is also probably important to have an orchestrated plan for participation which might involve only a small number of key or representative actors from different levels in the preparatory or low profile stages, but with a capability of expanding very rapidly once political leadership adopts the idea. The next stage might be to spell out a mix-and-match of strategic and tactical elements which would fit some of the more common reform scenarios provided by different reform types and different cultural settings.

In considering the mix and match of strategic and tactical elements, it was thought that the idea put forward in the discussions on barriers to generalisation could usefully be followed up, i.e. that of balances and in this case the "balance of enthusiasm" (enthusiasm should be balanced by realism if the initial impulse given to the innovation is to be maintained throughout generalisation). This idea can be applied also to other themes discussed: innovation should be balanced with tradition; it is not enough to inform the population of the advantages which can be derived from innovation, they must be shown how such an innovation is rooted in the past.

A balance between complexity and simplicity should also be attempted: considerable complexity results from taking into account all the factors influencing innovation during generalisation, but the constraints of putting the innovation into practice demand simplicity of rules and directives in order that these may be understood and applied without difficulty by the majority. In addition, a balance must very quickly be found during the course of innovation between the refinement and development of objectives and methods on the one hand and necessary stabilisation and routinisation of procedures on the other.

It is necessary to promote attitudes favourable to the reform but also to diffuse knowledge and create new aptitudes; reforms involve the creation of new roles, sometimes new professions, new opportunities open up while at the same time creating new constraints. The creation of a climate favourable to reform is not sufficient in itself to develop the knowledge and qualifications which may be indispensable to innovation.

Reforms often bring with them redistribution of power and responsibilities between ministries, central and local levels, between the administrative system and the schools. New balances of centralisation, decentralisation and autonomy become necessary between the central, regional and local authorities, between certain populations and interest groups. They need time to reach new positions of stability. A balance also has to be found between the power and authority of the centre and the call for autonomy and participation and another between new types of rewards and motiviation and the reorganisation of existing arrangements, since any generalisation of innovation has to give due consideration to scarcity of resources. Even though the innovation may benefit from exceptional additional means, this will have direct consequences on the educational system as a whole.

Another essential balance which should be attained is that between external and internal changes to the educational system. No large scale reform can be implemented in the educational system without some corresponding change in the social environment. For example, the development of new forms of training at the end of compulsory schooling, with new links between formal education and training for professional work, cannot be instituted on a large scale if they are not accompanied by changes in the organisation of work and in the structure of available employment.

All these relationships between often antagonistic elements constitute, taken as a whole, a global balance which may be optimal in the case of a strategy adapted to a society at a given moment, but will more often be sub-optimal because of the difficulty of harmonisation of the multiplicity of factors in play. Nevertheless certain elements may compensate for lack of others: enthusiasm may compensate for insufficient resources and time; political will may compensate for bureaucratic inertia; administrative stability may compensate for too frequent political changes. Strategies actually followed show elements of all the methods and "ideal types" distinguished by theory. They have to cope with situations where only a part of the pre-conditions for success are present, where factual knowledge is mixed with opinions and where the actions of partisans of the reform meet the more or less active opposition of those who are opposed or indifferent. In these situations strategies must compensate for insufficiencies in certain domains by what can be mobilised in others.

The efficiency of a strategy depends on the conditions of its insertion in the socio-economic and cultural milieu. Milieus and cultures are varied and there is no one administrative system which is necessarily the best. Any evaluation of the role played by educational administration in the generalisation of innovations therefore involves an evaluation of the adaptation of administration to the conditions of functioning and real decision-making processes of a given society and culture. This adaptation is even more necessary for administrations in developing countries which are based on structures inherited from colonisation: it is an essential element of endogenous development.

Future research on administrative problems posed by the generalisation of innovation as a large scale reform, the theme of this workshop, could therefore be usefully directed to types of educational reforms and methods of organisation and action compatible with different kinds of societies and cultures. For this it would be necessary to analyse how the often conflicting objectives and value systems in a given society lead to choice of pedagogies, actions, organisations and rules to govern the functioning of such organisation, the whole of which constitute a more or less original practical synthesis for the guidance of administration. The elements which give stability, fragility and fertility in these syntheses should be established, as well as the inherent disadvantages in their adoption and essential factors which are neglected that may put any attempt to generalise an innovation at risk.

BACKGROUND PAPERS

THE ADMINISTRATION OF REFORM:
INFERENCES DRAWN FROM THE STUDY OF EDUCATIONAL INNOVATIONS

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If progress is to be made towards equity there is no doubt that education must be one of the main means. Any new world order rests ultimately on the proposition that many individuals (and collectivities and congeries) *will* change their ways. They will not only come to *do* things differently from the way that habit and convention now dictate, but they will also come to take on new attitudes and embrace new values.

The change implied cannot be achieved by legislation, by fiat, by decree, or for that matter by coercion - however, desperate or dramatic the situation may be. In the last analysis, the advent of equity and social justice depends on an internalised acceptance of explicit values, and the rights and responsibilities for *action* contingent on them. The only way in which that can be achieved without a fundamental violation of the premises on which justice and equity rest, is through education - education of course, not necessarily confined in the narrow sense, to schooling.

If this assertion is true, then moving from our present unjust and inequitable condition to an ultimately just and equitable world entails changes - and massive changes at that. It is small wonder then that many countries (especially in the third world) have embarked on brave attempts to bring about such massive change. It is also not surprising that many have looked to the education system as the vehicle for carrying through the changes and that the desire for speed has been extremely strong.

Given the need and the intent, there is much cause for concern that such efforts have seldom come to fruition in the time allowed or been crowned with the degree of success originally envisaged. Experience suggests strongly that there is a great need, if practical results are wanted, to distinguish between the ideal and the possible, to recognise the

difference between rhetoric and reality and between promise and the likelihood of performance. However, the fact that many attempts to achieve ideals have failed does not vitiate either the ideals or the desire to achieve them. What is needed are better ways of getting there.

The purpose of this present paper is to examine the results of IIEP's project on innovations (PQIE) in the light of contemporary research and literature on innovation and change, in order to draw plausible conclusions about how the process of educational reform might be better undertaken. The aim is to deduce how educational reform might better be initiated, developed, implemented and sustained - in short, administered.

Because the acts of administration are considered to be (or ought to be) rational; in that policies, strategies, tactics and actions are undertaken on assumptions of causality, the approach to be adopted here will be a rational-causal one. Necessarily, because it has to deal with educational reform in general rather than with specific reforms, the approach will have to be broad and, to a certain extent, abstract. In order to communicate with a diverse audience coming from many countries, the argument must necessarily be provided in outline - perforce one step away from the real world of specific changes and reforms. Whether or not that outline is deficient can only be known when the characteristics of a specific reform are taken and fitted against the framework, hopefully to become more recognisable and better understood.

What has to be done here then, is to develop a comprehensible model of the reform process that: (i) has a capacity for generalisation to different countries, (ii) has scope for conversion into a set of administrative principles, and (iii) is capable of translation into organisational and administrative practices.

While the applicability of any model, like any reform (House, 1979) hinges as much, if not more, on socio-political factors and market visibility than on the model's inherent characteristics, nonetheless there are a number of criteria to which any model may reasonably be expected to conform.

First, it should provide a descriptive analogue of the domain.

In other words, as a working model it should be able to be described in terms that appear to make sense. Invariably the description will have to resort to analogy, borrowing its terms from other established model forms, e.g. organic, mechanical, electronic, etc.

Second, it should specify its own dimensions, (i) exhaustively, and (ii) exclusively.
i.e., it should list the component parts of the working model in such a way that all the parts are included and no part is confused with any other part.
Third, it should postulate relationships within an explanatory mode.
i.e., it should indicate how the parts fit together, how they affect each other when the model is working, why given effects come about and what is necessary in order that a required effect should follow.
Fourth, it should be consistent with credible research findings.
Ideally, a model should not only be compatible with what is known, it should have the capacity to generate principles that would also be compatible with existing knowledge. Those principles would operate much as general laws are expected to operate, to indicate the circumstances under which certain events are likely to take place.
Fifth, it should provide a plausible basis for prediction.
i.e., it should enable those who wish to bring about change to have a reasonable basis for believing that if they take a particular action or set of actions, the end desired will result. By definition, any reform breaks new ground, consequently the process of reforming has often to proceed on faith - in the belief that a given action will produce a given consequence. Thus reform planning and administration may on many occasions be exercises in guesswork. Ideally the element of risk in guesswork should be as small as possible.
Sixth, it should have operational and theoretical contiguity.
i.e., although the model must be (by definition) an absraction and must have theoretical overtones (and probably undertones) a good model will, when applied in a real life situation, make sense. Its components will be unambiguously identifiable, the connections between the parts will be clearly recognisable and, when the (reform) system is

examined in its working state, the way it works will be found to parallel the way the model stated it would work.

Among the models of educational innovation available, the three that have most contemporary credibility are those of Havelock & Huberman (1978), Dalin (1978) and Berg & Ostergren (1977).

All meet the six criteria to a lesser or greater extent. The most comprehensive analogue - a systems based one - is to be found in Havelock & Huberman. It owes much to Havelock's earlier conceptualizing (1971 et ff.), to Huberman's compact review of innovation (1973), and to a thoughtful examination of a number of innovation case studies, evaluation reports and to one specific research study of a group of 81 technicians, administrators and directors of national teacher training programmes.

In developing their model, Havelock & Huberman take the Lewinian position that "nothing is as useful as a good theory" and assert that if what is already known about educational change were coordinated and organised, we would have a good basis for making the process of innovation and reform more rational and effective. To this end, in chapter nine they attempt an analysis of the strategies of innovation implicit in the views of innovators themselves - a sort of sub-surface analysis of belief systems that could be regarded as a "technical guide to innovation". As they say, the resulting strategies may or may not be effective and mutually consistent - but they do represent a kind of "conventional wisdom" of innovation. Each strategy is named and elaborated. There are five. They are: Participative Problem Solving; Open Input; Power; Diffusion; and Planned Linkage. This paper owes most to Havelock & Huberman's ideas on systems, in particular (i) the way systems may grow and develop from an initial set of minimal relationships to a condition of "dynamic cohesiveness", and (ii) the idea that the proponents and agents of any innovation, once they come together, start to constitute a separate system which in turn shows all the characteristic self-protecting and self-promoting devices of other systems.

Dalin, after his early studies for CERI (1973) has given increased attention to organisational development. In *Limits to Educational Change*, Dalin, noting Chin & Benne's well-known classification of theories of change; (i) Rational-Empirical, (ii) Normative-Re-educative, and (iii) Power/Coercive; made the important observation that "there are no operational models in education based on conflict theory". His own model, which postulates certain *Basic Factors* and *Critical Dimensions* of the innovation

process, explains the dynamics of educational change in terms of the complex interaction between "the educational setting", "the environment", "the innovation" and the "change strategy" used. Within each of these, Dalin identifies among the many "dimensions" available, certain critical ones that, in his view, must be taken into account. Thus in the *Education Setting* the critical dimensions are: Financing, Decision-Making, Support Structure, Size (of the system) and School Level. Those in the *Environment* are: The Economy, Political Stability, Social Expectation, Labour Market, (Education's) Relation to other Sectors, Technological Change. Those in the *Innovation* itself are: Technological Change (within the institution), Behavioural, Organisational and Social Change, Centrality (of the innovation in the eyes of the users), Complexity, Nature and Amount of Change (implied), Goal Fit and Goal Stability. Those in the *Change Strategy* are: Change Strategy Norms (prevailing attitudes), Decision-Making for change and Linkage.

Dalin then employs his model first to interpret various findings (particularly those from the CERI studies) and draws the conclusion that,

> "institutions do not adopt innovations and they do not create them either. Institutions adapt and develop innovations."

He follows this with a series of propositions about the conditions under which change is likely to come about effectively when the School is seen as the unit for change.

Berg & Ostergren, who have concentrated on higher education, warn against the dangers of generalising prematurely to other fields of innovation from their limited study. Nonetheless their model has considerable plausibility. Conveniently they provide a concise summary:

> "1. An innovation theory is valid for a certain type of innovation in a certain type of system. Certain elements of a theory may be more generally valid, i.e. various innovation theories may overlap. We do not maintain that our attempted theory is valid for any other system than the higher education system, and we regard it as valid only for innovations that are system-divergent and affect contents and methods of education. Still, it may be possible that points 2 - 8 below are generally valid for system-divergent innovations in other complex formal systems as well.
>
> 2. The conditions for change are determined mainly by system characteristics.
>
> 3. The major characteristics of a system are membership composition, ideology, technology, organizational structure, and relations with the environment.

4. Systems tend to defend the interests of their members, their ideology, their technology, their organizational structure, and the nature of their relations with the environment.

5. The innovation process is a political process that takes place in a field of mutually opposing forces around an equilibrium. The development is, in accordance with Lewin's theory, explained by the state in the field as a whole.

6. The main phases of the innovation process are unfreezing, moving, and re-freezing (Lewin). Unfreezing means that the possibility for change is created. Moving means a continuous disequilibrium, caused by the dominance of the driving forces over the restraining forces. Re-freezing means that balance is created around a new equilibrium.

7. Innovations that deviate from the system can occur only under the following conditions:

   (a) There must be a "crack" in the system. The "crack" is created when components of the system (subsystems or individuals) deviate from the main characteristics of the system.

   (b) There must be a connection between the "crack" and the environment.

   (c) Impulses from the environment flow into the "crack".

8. In a specific system, the conditions for change are determined by the detailed contents of the main system characteristics. Thus, each system type must be anlayzed separately with regard to its system characteristics.

9. The total field situation can be defined by analysis according to points 2 - 8 above; the field as a whole explains the general conditions for change or non-change. In order to refine the definition of change in a specific case, it is necessary to utilize a conceptual apparatus that explains relevant interactions and inter-relations in the field.

10. A highly provisional mechanism for description of certain aspects of the innovation process would consist of the concepts of level of conflict, visibility, personnel changes, linkage, correlations with external changes.

11. The innovation process can be explained by means of the four concepts of gain/loss (needs, interests), ownership, leadership, and power."

Conveniently again they provide some "rules of thumb for change strategies":

"1. Most important of all is thorough knowledge of the system, its characteristics, and its reactions to innovations.

2. It must be possible for innovators to reach positions where they can act in favour of change. The system must tolerate those who deviate from it and let them influence the development.

3. The occurrence of change processes should be encouraged through staff training, organization development, action research, project groups, activity evaluation, staff mobility, and external contracts.

4. Support from superior levels (financial and otherwise) for innovations is often limited to the early stage of the innovation process. It is important that the support continues throughout the entire process. Freqently the re-freezing phase is particularly critical.

5. It is more advantageous to attempt to decrease the restraining forces than to strive for an increase in the driving forces.

6. One should not believe that high visibility is always of advantage for the innovation.

7. It is important that personnel changes take place, but individual security should not be threatened by such changes. Mobility is needed within the system as well as between the system and its environment.

8. External systems should be allowed to influence the change processes.

9. For the implementors of the innovation, the risks of loss should be minimized and the potential of gains maximized. This means, for instance, that selective financial support should be available. Attention should also be given to the potential for security and self-realization.

10. In some way, the implementors of the innovation should have participated in its design, creation, or development, so that they experience ownership.

11. The importance of leadership must be more fully recognized in the higher education system. The positions of the formal organization leaders must be strong and the assignments attractive.

12. A calculation of the power situation (the potential force field) should be included in each evaluation of the possibilities to implement a change."

After this brief commentary on three models that merit far greater attention, an equally brief examination follows of several recent reviews of innovation and change research. They vary in perspective and intent but help to give an overview of the general field.

The widest theoretical view is taken by Dill & Friedman in their "Analysis of Frameworks for Research on Innovation and Change in Higher

Education" (1979). Adopting an almost meta-analytic stance, they attempt to discern structures underlying research into innovation and change. They start with Gamson's (1974) four types of orientations or frameworks, viz. (i) Complex Organisation, (ii) Conflict, (iii) Diffusion, and (iv) Planned Change. After pointing out the strengths and weaknesses of each orientation (an exercise that left Planned Change research somewhat decimated), they produce *explanatory causal* models for each of them. These models they present as "causal flow-graphs" which attempt to postulate how certain key variables interact with each other to influence how the change strategy would develop. Although designed for research purposes, any of these models, if verified, would carry a number of implications for those responsible for the planning and administration of change.

House (1979) in his selective review of innovation literature, draws attention to how perspectives on innovation have changed - presumably in response to changing circumstances. Thus he attributes the initial preoccupation of such research with a *Technological Perspective* due to the precipitating influence of Sputnik I. Under this broad heading, House clusters programmes intent on achieving educational proficiency particularly through the use of the Research, Development and Diffusion paradigm, and shows how the prominence of that perspective gradually diminished when sensitivity to the interpersonal aspects of innovation grew. The *Political Perspective* then came to take its place as the significance of advocacy, political influence, and participation was recognised.

> "Politics are those processes of discourse through which members of society seek to assert and ultimately reconcile their wishes. So those people who wish to make education non-political are either failing to understand that the purposes and procedures of education reflect what people want, or they are trying, perhaps unconsciously, to restrict the rights of fellow citizens to participate in decisions of deep and abiding importance to them."
>
> (Kogan, 1978)

Predictably, the third Perspective would be more inclusive. The *Cultural Perspective* took, to some extent, the technological and political perspectives and set them in an environmental perspective. Culture, whether of the school, the education system, the immediate community or the community at large, separately and in interaction, all were seen to affect the progress and process of innovation.

In House's words, "the shift has been from the *innovation* to the *innovation-in-context*, to the *context* itself". The implications are important.

> "From the technological perspective, it is all right to proceed aggressively since the idea of progress is shared by all. From the political perspective, securing the cooperation of others becomes problematic. One must reach agreement with them, come to understandings, secure their assent before proceeding. From the cultural perspective, even common agreement is problematic since two different cultures may not understand each other. The possibilities for misunderstanding multiply. One must be concerned about the unanticipated effects of an innovation in an unknown culture. Action becomes difficult."

The most focussed of the relatively recent reviews is Fullan & Pomfret's examination of the research on curriculum and instruction implementation (1977). In it, after surveying the literature, they undertook an analysis of the "Determinants of Innovation" and arrived at four broad categories with some fourteen components. They are:

(a) Characteristics of the Innovation
  (i) Explicitness (what, who, when, how)
  (ii) Complexity

(b) Strategies
  (i) In-service training
  (ii) Resource support (time and material)
  (iii) Feedback mechanisms
  (iv) Participation

(c) Characteristics of the Adopting Unit
  (i) Adoption process
  (ii) Organizational climate
  (iii) Environmental support
  (iv) Demographic factors

(d) Characteristics of Macro Sociopolitical Units
  (i) Design questions
  (ii) Incentive system
  (iii) Evaluation
  (iv) Political complexity."

They then extracted from the research some forty or so illustrations of what might be called "principles" operating to influence the implementation process. From these they derived some policy implications, including the following:

> "It should be clear by now that implementation is a highly complex process involving relationships between users and managers, and among various groups of users, in a process characterized by inevitable conflict and by anticipated and unanticipated problems that should be prepared for prior

to attempting implementation, and continually addressed during it.

In order to support more effective implementation some major interrelated steps are necessary.

First, instead of promoting specific innovations, central policy-makers would be emphasizing broad-based programmes *and* providing corresponding support for local development of specific forms of implementation.

Second, local experimentation should be encouraged during implementation to develop variants of innovation in which specific goals and means are seen as *consequences* of exploration, negotiation, and "development in use".

Third, evaluation of innovative projects at least during initial implementation should be directed toward *facilitating implementation and local system capabilities* through data feedback and other forms of support, rather than toward judging success or failure.

Fourth, and closely related to the previous points, the incentive system for implementation would have to be drastically altered at all levels. If there is one finding that stands out in our review, it is that effective implementation of social innovations requires time, personal interaction and contacts, in-service training, and other forms of people-based support. Research has shown time and again that there is no substitute for the primacy of personal contact among implementers, and between implementers and planners/consultants, if the difficult process of unlearning old roles and learning new ones is to occur. Equally clear is the absence of such opportunities on a regular basis during the planning and implementation of most innovations. All of this means that new approaches to educational change should include longer time perspectives, more small-scale intensive projects, more resources, time, and mechanisms for contact among would-be implementers at both the initiation or adoption stages, and especially during implementation.

These suggestions, of course, involve major changes in the roles of researchers and developers, as well as of policy makers. Collaborative forms of development with practitioners, especially during implementation, would be necessary.

Let us be clear that we are not suggesting that local users determine all innovation decisions. In fact, national social mandates may require strong federal initiative and follow through, in some cases, in particular innovative programmes. We are saying however, that if implementation is to occur on a wider scale, different aspects of the innovation process must be emphasized and a different basis for central/local relationships and processes must be developed.

A great deal of work remains to be done on conceptualizing the meaning and processes of implementation, on gathering

and analyzing data on different aspects of the process, on assessing the consequences of different strategies, and on deriving specific policy recommendations at all levels of the political and educational system. In the meantime, perhaps the best single guiding rule is the one formulated by Williams:

> Always think about implementation problems, and always worry that others are not thinking about them, but do not expect major improvements to come quickly."

Up to this point the paper has attempted to point out some of the broad issues involved in attempting to bring about social change when education is to be used as the vehicle. The positions taken by various writers at times either overlap, complement each other or are quite tangential to each other. It follows then that no one position will have universal appeal and no one position will be free of shortcomings.

The remainder of this paper will address the issue of the administration of educational reform, particularly from the viewpoint of experiences of the PQIE study on educational innovation. Necessarily this will entail:

(a) establishing a connection between innovation and reform,
(b) extracting from the PQIE project those aspects that can be argued to be relevant,
(c) eliciting from the PQIE experience certain "principles" that are thought to apply to reform and
(d) drawing from them implications for administration.

The connection between the first section of the paper and the second should then become apparent.

If, as the earlier paragraphs stated, an educational reform entails a substantial change in the actions, attitudes and values of many people, the first and most fundamental problem to be overcome is to enable the first step to be taken - to create the conditions within the system (presumably the education system) which permit impetus towards change to start.

Although research indicates that grassroots innovations (undertaken in the lower echelons of the system) tend to have a better survival record than top-down (Ministry originated) innovations, the principle involved initially in both cases is the same. The initial idea about what form the change might take, has to gain entry to the system at some point. It then has to be able to cling there until it can infiltrate the rest of the system prior to gaining widespread acceptability and usage.

For the sake of definitial clarity it is useful to distinguish between (i) the varying degrees of penetration into the system of any change or

innovation, and (ii) the scope or magnitude of the change involved. Both can vary between large and small and minimal and maximal. In Figure 1 below, the four logically possible alternatives appear.

Figure 1. Characteristics of Change

		Degree of Penetration	
		minimal	maximal
Magnitude of change	minimal	1.1	1.2
	maximal	2.1	2.2

The four cells cover the full range of alternatives - from a situation in which both the amount of change and the degree of penetration into the system are minimal (1.1), to one in which both are maximal (2.2), and the two points in between.

The figure enables a useful distinction to be made between the terms innovation and reform themselves. Any *new* change must first be regarded as an innovation relative to the system. A change of minimal magnitude (relative to the system involved), whether it achieves maximum or minimum penetration, cannot be regarded as a reform. By contrast, a condition of maximal change that achieves maximum penetration must be regarded as a reform. In the early stages of an incipiently "big" change, when only minimum penetration has been achieved, the innovation can be regarded as either a "comprehensive" or "wide ranging" *innovation* or a potential (but as yet unrealised) *reform*. Any innovation that is small in magnitude can only become a reform by increasing its magnitude.

The necessary characteristics of a reform are then that it constitutes a change that achieves widespread manifestation (penetration) and affects a considerable part of the system (magnitude). The operable word however, is manifestation. Unless there is manifest evidence that the change has actually taken place, the use of the word reform (if it is to be used at all) must be qualified. Thus "incipient", "prospective", "intended" or "planned reform" would all be appropriate to describe the situation prior to implementation.

In the account of the PQIE study, *The Process of Educational Innovation: An International Perspective* (Adams, Chen et al, 1980), an attempt was made to provide an organic analogy in which the (education) system was seen to consist of a series of interlocking and mutually

influential groups which, for the analogy's sake, were seen as sub-systems or cells. These cells, which contain designated individuals and undertake defined tasks, can be regarded as "territories". Both the cells and the individuals in them tend to protect their territories or, as Havelock & Huberman put it, "maintain their boundaries" against intrusion from "aliens" whether those aliens are people or ideas - particularly ideas for change.

> "This construction can be illustrated by regarding the national context as a gigantic multi-cell organism, with each of the cells comprising the various internal groups. They in turn are composed of lesser sub-groups with individuals (as the smallest unit of analysis) cohering to make up the various collectivities. Each individual might be pictorially represented as a kind of small amoeba which sits there pulsing (as it makes its internal boundary adjustments to its own meanings, values and norms). The sub-group and groups can also be seen in the same way, pulsing too, in response to internal forces. But all of these amoeba-like elements move in relation to their fellow amoebas attracted by some, repelled by others. When two or more make contact however, some kind of accommodation is necessary. That accommodation may lead to total amalgamation, part amalgamation, agreement to go separate ways or even destruction of one or the other.
>
> What is fundamentally under consideration here is how an old system can accommodate to the new and how that accommodation can be promoted. This leads to a consideration of the circumstances under which innovations gain first toe-holds in the system and subsequently come to consolidate their positions. The issues at stake, though complex themselves, can be stated quite simply. They are:
>
> 1. Under what conditions do innovations tend to become initially acceptable?
> 2. Under what conditions do innovations tend to persist beyond the stage of initial acceptance?
> 3. How long does it take for an innovation to permeate the system?
> 4. How extensive may an innovation be (how big an innovation can be tolerated at any time)?
>
> Fairly clearly, these are issues that bear on the concerns of planners and administrators."

To desert the analogy for the moment, if the first problem with any reform is for it to appear as an idea, and if the process of innovating is not intended to be haphazard and fourtuitous, then the first *administrative* requirement is establishment of a mechanism within the national system to generate ideas that can eventually be converted into innovations and thence into reforms.

While a comprehensive study of the origins of ideas for national reforms has yet to be made, casual observation would suggest that their origins vary. They may emanate directly from powerful political identities, e.g. as did Tanzania's education for self-reliance from President Nyerere's directive (Mhaiki, 1979). They may come from the inner recesses of the political machine, e.g. as did Poland's compulsory secondary education from the initiative of the Political Bureau of the Central Committee of the Polish Unified Workers' Party (Kaczor, 1979). They may emerge as part of a broader plan for national development, e.g. the Ivory Coast's scheme for Educational Television in 1971 (Konan-Daure, 1979), or follow from the setting up by government of interim bodies (committees or commissions) charged with a specific task, e.g. Sweden's comprehensive schooling reform in 1940 (Moberg, 1979). Sometimes they are taken from the writings of ideologues, e.g. as was Russia's "humanization of science" (from Marx) (Obraztsov, 1979). Whatever the means, however, there has to be scope for the infusion of new ideas into the system. How such scope is provided, probably depends on the nature of the system, the resources open to it and the developmental condition in which it finds itself. It is noteworthy that in the United States, given the autonomy and independence of the various states and of the various school districts, reform and innovation is neither institutionalised at the national level nor planned for in any systematic way. This is not to say that prominent agencies do not promulgate reformative ideas - they do - but whether they are taken up depends on the inclinations of their various audiences. It is small wonder that the innovation *diffusion* model was found so congenial for so long in the United States. Similarly noteworthy is the fact that in a number of countries, designated units in the Ministry of Education have been given special responsibility for Planning Research and Development. Indonesia and Malaysia in the PQIE study constitute two good cases in point, though such developments are by no means confined to South East Asia.

In broad general terms then, reform ideas seem to arise in three ways: (i) from political and ideological channels; (ii) as a result of deliberate (public) enquiry (often via specially set-up groups); and (iii) by osmosis - a seeping in from outside the system or country concerned. With respect to the last of these, it is noteworthy that Unesco has sponsored the setting up of a number of international groups concerned with innovation. Of these APEID (The Asian Programme of Educational Innovation for Development) has been established longest and is most developed. One of the first tasks

adopted by its member countries was to set up a network whose prime purpose was to heighten general awareness of the types and varieties of innovations being undertaken in various places.

To have ideas is one thing, for them to be worthwhile and become acceptable are yet others. These last two aspects are closely and uncomfortably related. Worthiness is no guarantee of acceptability but without acceptability, worthiness is of no consequence. Consequently the establishment of worthiness often becomes a matter of finding the circumstances under which the innovative idea will become acceptable to those whose acceptance is critical to its survival. This appears to be saying, "if people accept it, it must be good", and could, mistakenly, be seen as unduly pragmatic and perhaps even cynical. On face value such a position might appear to cut across the purposive idealism that lies behind much writing on educational reform, for example, like the conclusions reached in the Final Report of the Unesco conference on "Major Problem Areas of Educational Reforms in the 1970s and 1980s" (Unesco, 1979). It stated, "overall objectives of reform in education should include measures to guarantee education for all as a basic human right and the alignment of social and educational reforms to generate meaningful employment". However, the thrust of the present paper is to consider the conditions under which reforms are likely to come about. It follows from the way in which the process of reform has been conceptualised, that if the idea of any reform (however desirable) cannot gain a toe-hold in the system because some influential sector will not accept it, then clearly the reform cannot (yet) occur.

As to the *administrative problem* of providing the means by which the innovative idea can become *initially acceptable*, some of the mechanisms for generating ideas that were referred to above, serve also as means for establishing initial acceptability, e.g. Research and Development Units, Commissions and Committees for Enquiry insofar as their recommendations are approved and acted on. Such formal provisions relate best to systems where top-down development strategies are characteristic. In systems where innovation occurs at the grassroots level, initial acceptability depends not so much on direct official sanction and approval but rather on the market appeal of the idea.

The PQIE project, in attempting to accommodate the apparent fact that though all innovation depends on the acceptability of the innovative idea, acceptability of specific innovations does not depend on *first* gaining

approval at the top, put forward the following operating proposition:

> "The initial acceptance of an innovation is a function of the *relevant* power than can be marshalled in its support. The greater the relevant power, the greater the likelihood of acceptability."

The word *relevant* is crucial in the proposition because although power (as the essential component of the political domain) is critically important in the acceptability of an innovation, power is relative to the context. The politically powerful certainly have to be convinced (or appeased) but in the local grassroots (political) context, the power of the national political leadership may, on many occasions, be initially less relevant. More important at first, may be the power of the local Principal, the local civic leader, even his wife or secretary or even, under certain conditions, the school cleaner (see Chapter 7, Adams, Chen *et al*, 1980). To this extent then, there are grounds for qualifying Watson's (1969) statement:

> "Resistance (to change) will be less if the project clearly has support from top officials of the system."

Clearly that depends on the system, the type of innovation and style of innovating. At times top official support can be most relevant, at times it can be irrelevant, and at other times it can even be dysfunctional.

A return to the analogue seems warranted. If the education and national system can be seen as an interlocking array of amoeba-like cells and if the innovation idea is seen to be taking hold in only one of the cells, the location of that cell in the system: whether high or low, whether important or unimportant, whether central or peripheral, determines what type and level of political support is necessary to help ensure acceptability. But it does so in conjunction with another structural feature of the system - the degree of centralisation of authority and control. Thus the lower the cell (group) the less important it is, the more peripheral it is *and* the more decentralised the system, then the less acceptability depends on support from top officials. Implicit in this last argument is the idea that the two dimensional analogue should be seen in three dimensions. Now it is necessary to imagine a hierarchical array in which some of the cells are placed in layers above the bulk of the cells that comprise the population at large. The top layer constitutes the most powerful (whatever the criteria), the bottom the least.

Also implicit in the last discussion was the idea that the power and influence exerted by any cell (wherever it may be in the hierarchy) may be more or less pervasive. Clearly, in highly centralised systems, the power and influence of the central authority would blanket the system. In semi-decentralised or regionalised systems there would be clusters of cells, each internally arranged in hierarchical layers, but with interconnections between the clusters. The interconnections would probably be more pronounced among the higher echelons (but not necessarily so, vide national teachers' unions, national associations of parents and even national student associations, etc.) In completely decentralised systems one might reasonably anticipate that the clusters would be more numerous, smaller and less hierarchical, with relatively few interconnections between the clusters.

But the model needs further elaboration. Consistent with Havelock & Huberman's acceptance of the idea of boundary maintaining systems, the cells in our system (and the individuals in them) are to be seen as essentially conservative (or conservationary), inclined to favour the status quo and characteristically opposed to any intrusions into their "territory", especially when their proprietory rights over that territory may be thought threatened. Such an interpretation is consistent with and explains both the considerable amount of evidence of resistance to change found in the literature and the continuing preoccupation of many researchers with what has been called "barriers" to change (Havelock & Huberman, 1978). One PQIE working proposition addressed this specifically:

> "The initial acceptability of an innovation is a function of the extent to which, as a change, it is seen to threaten the power of existing groups. The less the perceived threat, the greater the acceptability."

This premise, which perhaps fits best within conflict theory, needs to be complemented by others if a more adequate expalantion of factors that influence acceptability is to be achieved. This time the proposition owes allegiance to exchange theory, and contains within itself the prospect of overcoming resistance.

> "The initial acceptability of an innovation is a function of the extent to which the benefits expected to result are thought to be in excess of the costs entailed. The greater the benefits (relative to cost), the greater the likelihood of acceptance (and vice versa).

What then are the administrative implications? If the first administrative requirement for reform is a mechanism somewhere in the system

that would generate prospective reform ideas, the next administrative requirement is another mechanism that would enable such ideas to be negotiated into (and eventually through) the system.

Clearly the effectiveness of such a mechanism hinges on:

(a) the selection of the right sectors in the system with which to negotiate, and

(b) the capacity to negotiate with skill.

What is required apparently is a *critical path* through the system that avoids waste of effort and time. In a characteristically hierarchical and centralised system the classic path would be to start at the top and work down through recognised chains of command. This, in organisational terms, represents the most orthodox solution. It may not however, be either the least costly or the most effective. Neither need it be the most appropriate for a regionalised or a decentralised system.

There are certain factors on which the effectiveness of any chosen route depend; these are related to (i) the nature of the innovation (reform) envisaged, (ii) customary "spheres of influence" of the various sectors of the system, and (iii) the targets - i.e. the groups that actually have to carry out the reform. To illustrate: a curriculum reform that requires teachers to employ substantially new approaches, will entail a quite different set of negotiations and chains of communication than will one that requires an increase in the availability of schooling for a substantial, new population. Again, in systems where the teachers' union is strong, as contrasted with those in which inspectors wield much power and influence, the lines of contact will also be quite differently drawn. Similarly, where in one case the target is (say) the travelling "advisors" dispersed throughout the country, and in another where the target is (say) Ministry pay-clerks, once again the directions taken should vary.

If then the critical paths are likely to differ from situation to to situation - according to country, system type and task, then one of the essential tasks for the negotiating mechanism is to know the appropriate routes through the system. What is needed is the capacity to undertake a "network analysis" appropriate to each innovation or reform. While there is no scope to elaborate in detail on the way in which network analysis could be undertaken, the operational strategy can be stated simply enough.

If the objective of the reform is to have certain identifiable cells take on a new character, the ultimate target group ought to be able to

be relatively identifiable. In addition, there ought to be some relatively clear appreciation of what the ultimate condition of the target group (once reformed) would be. In other words, the way in which the reform is to be manifested ought to be able to be specified. To take a case in point. Picón-Espinoza (1979), in writing of the Peruvian Reform Plan of 1969, identified three major objectives:

(a) Education oriented to work training, integrated with the national development plan,

(b) Education aimed at transforming the structure of Peruvian society,

(c) Education that affirms identity and independence.

Even though such objectives are expressed in general terms and are so awesomely comprehensive, they could nonetheless be converted to statements indicating what an education system applying those objectives should do. The operations of the personnel, the physical conditions of the work-place, and the organisation structures could all be specified. That done, it should also be possible to discern the *order* in which they would have to fall into pl[illegible]. For example, education aimed at transforming the structure of society could not proceed until the desired structure and the way in which education might induce it have been specified.

The (deceptively simple) question to ask repeatedly is, "what are the pre-conditions necessary for the end-state desired?". It can be applied to the Peruvian illustration. If a new Work Training curriculum is to be developed for teachers to use - "what conditions would have to be set up in order first to produce it?" Given an answer that allows the identification of those conditions, the question can be asked again - "what conditions are necessary in order to provide the capability to produce it?" The same question can be further developed until the answer reflects the conditions existing at the moment - because that is the only foundation on which it is possible to start to build.

At that point, what is then left is a statement of a rational sequence of events that could (theoretically) be engineered step by step in order to yield eventually, the desired condition. Envisage next the same question being asked with respect to *each* of the identifiable manifested end-states of the reform. Envisage too the resulting *series* of sequences reconciled to each other. Then there would exist (in principle) at least a higherarchical framework (plan) for orderly development.

Such a sequential analysis, even if not done as exhaustively (or as systematically) as the previous paragraph may have seemed to imply, is a necessary pre-condition for identifying the critical path to follow in order that the reform be first, accepted, and second, fall into place. Implicit in the step-by-step procedure suggested is recognition that one set of events constitutes a necessary condition without which the next cannot occur. In such a sequence of events where each event is dependent on the one before it, the effective administration of reform calls for a particular (and often neglected) skill - the ability to negotiate appropriately, skilfully and *in proper sequence* with those who can exert control and influence for good or ill at any stage. Because such levels of control vary, they often require different negotiation styles (as the Bunumbu and Whanau House projects in the PQIE study demonstrated). Before negotiation can get under way however, the use of network analysis would be necessary in order to derive from the sequence of events specified, a recognition of what groups and sub-systems would need to be influenced and in what sequence.

In the PQIE model each cell or group is seen as basically defensive, inclined to reject the idea of change rather than accept it. It is for this reason that the nature and type of negotiation becomes extremely important. Research results show time and time again that withought careful, considerate and sustained support at the personal level, innovations inevitably collapse (Fullan & Pomfret, 1977).

Two of the working propositions from the PQIE study are relevant:

> "The initial acceptability of an innovation is a function of negotiation protocol. The greater the violation of protocol, the less the likelihood of acceptability."

Nowhere is this assertion better confirmed than in well-known evidence from earlier foreign aid undertakings where the aid programme collapsed once the authoritative (and authoritarian) expert left. But the principle applies even within internal systems. Not every District Superintendent has the capacity to confer with the various hierarchies of people underneath him in such a way that he can gain their cooperation and support and generate their self-sustaining effort. Within any society's complex social networks, entry to the various parts is, in one way or another, restricted. Without the appropriate credentials and (diplomatic) observances, credibility cannot be assured and even contact may be precluded.

Assume however, that the bearer of reform tidings (i) has come to the right place, (ii) is seen to be legitimate, (in that those in power

there support him), (iii) has (courteously) observed protocol, (iv) is not seen to be threatening the power of the group, and (v) appears to be offering rewards rather than punishment. Even so a break-down may occur. If the research literature is correct, there is often a credibility gap between what the reform promises and the conditions existing at the moment. Sometimes the dream is so divorced from reality that it invokes the scepticism of those hearing it. Proposition #5 of the PQIE study foretells the consequences.

> "The initial acceptability of an innovation is a function of the rhetoric used. The more the rhetoric conveys the impression of difference between the innovation and the status quo, the greater the likelihood of rejection."

These last four working propositions give rise to a further administrative implication. Not only should there be a mechanism through which entry of the reform idea is negotiated into the system, but also relevant skills, techniques and procedures of negotiation should be employed. In other words, the functions of the mechanism should be specified and put into operation.

The situation existing in the system at this point is that the reform idea has found its way into the system and the will to make it work exists. The question then is, under what conditions will it *not* work. The answer in broad general terms is easy enough. If the capacity to do what is required does not exist then it cannot work. This means, in equally broad terms, that if the *human physical resources* are not there either in quality or quantity, if the *environmental conditions* are not congenial, if *organisational structures* and *procedures* are inadequate, or if the method of attaining the task is flawed, then the odds against success are likely to prove too heavy.

The Unesco Educational Reform Conference of 1977 put it this way:

> "The meeting agreed that the Secretariat working paper and the country case studies prepared by several of the meeting's participants provide rich analyses of problems and obstacles encountered in translating planned reforms into practice. The discussion gave particular attention to the following, not all of which affect every country: the failure to design an operational strategy for introducing, implementing and correcting reform; the danger of conflict between democratization and the maintenance of conventional standards; inadequate financial and material resources; the lack of clarity in objectives for reform; the stranglehold on reform exercised by the examination system; the possible alienation of children and parents

> when reforms are too ambitious or not adapted to local conditions and when children are educated while educational opportunities are not available for the illiterate parents; the neglect of, or inadequate training for, the whole range of personnel responsible for aspects of implementation, such as teachers, administrators, evaluators, etc.; the neglect of components such as educational technology and changes in organization; imbalances between political will for reform and professional competence to effect changes; inappropriate institutional framework; the lack of linkage between education and work.
>
> It was noted that embarking on reform in education brings with it uncertainties, side-effects, and paradoxes which require flexible and pragmatic management and continuing evaluation and correciton. For example, the very success of a reform in primary education creates new problems in secondary education; quantitative change at certain scales becomes qualitative change; personnel at operational levels and the population directly concerned are often in an as good or even better position to be aware of and adapt to difficulties than are planners and policy-makers - their views and participation must be provided for."

In the same report, Picón-Espinoza identifie aspects that he considered critical in the progress of the Peruvian Reform: Theory; Policies and Programmes; Planning, Research and Management. The implication was that difficulties experienced in any one of them could prove too much.

For its part, the PQIE study attacked the problem of innovation survival by asking the question, "under what conditions is an innovation likely to persist?" It came up with several propositions.

The first "positive" proposition is similar to the last one on "acceptability" (#5).

> "Persistence of an innovation is a function of the innovation's credibility. The greater the gap between promise and performance, the less the credibility. The less the credibility, the less the likelihood of persistence."

An innovation introduced on the strength of persuasive advocacy (rhetoric) may, once action starts to take place in earnest, be seen to fall some distance short of the hopes and aspirations of either the promoters or its customers. Perhaps the most dramatic case in point is the case of computerized instruction (CAI), as it first appeared in the United States in the 1960s when the "big" computers were beginning to capture public imagination. CAI was clearly an idea ahead of its time, and as the promises that were held out failed to materialise, so did hopes fade and disillusionment follow.

However, when the literature is searched for explanations of the failure of innovations, or their lack of persistence, the answers are found to be varied and, it must be admitted, somewhat confusing. What appears to be lacking is an agreed upon systematic framework into which the answers may be fitted so that the dimensions of the problem - its essential components - become clearer. In other words, are there common, even universal, aspects of the process of reform that ought always be taken into account? Lin & Zaltman (1973) thought so, and produced a list of face-value justified categories that they called "attributes" of innovations. The PQIE project, in an attempt to deal with this issue, came up with some eleven categories or aspects that the various members of the project (administrators and researchers) considered should be taken into account. The categories were:

Personnel
Task specification
Method
Equipment
Plant
Cost
Social context
Time
Scheduling
Rationale
Effects evaluation

These categories were initially generated by using a socio-linguistic device, the question:

> "Who does what, with what, to whom, where, when, in what manner, why and with what effect?"

Subsequently however, the categories came to reflect a logical argument. It follows:

> "The "success of an innovation is a function of the extent and quality of provision made for: (i) advancing a convincing argument (*rationale*) in support of the idea; (ii) deriving (from the rationale) a realistic and practical *specification of what the task entails*; (iii) obtaining *personnel* of the quality and in the quantity necessary; (iv) ensuring that *plant* and *equipment* are appropriate and sufficient; (v) designing a *method* of procedure that realistically takes into account: the rationale, the task specification, the resources available; and (vi) the *cost*.
>
> As well as this provision for what might be called essential intellectual, material and human ingredients, the "success"

of an innovation is also a function of the provision made in respect of the process of innovating itself, viz.: (vii) the sequencing, *scheduling* and coordinating of events - the logistic aspects of development and distribution which are in turn dependent on (viii) the *time* allowed, and (ix) the effective analysis of that "critical path" through the system which will ensure that contact with other impinging *social contexts* will facilitate rather than inhibit progress. Finally, the success of an innovation is also a function of the provision made for the *evaluation of effects* insofar as that entails the monitoring of the process and the feedback of results.

In the seven innovations of the PQIE project, whether or not these events were provided for in the planning process, the development and implementation processes, would, it was thought, determine whether or not the innovation process itself would work. There are a number of questions that such an analysis (and set of assumptions) would prompt. Are the dimensions adequate - are all the ingredients there? Is there a necessary order or sequence to events? For example, should the development of a *rationale* precede the specification of the task - as the RD & D model would imply but as few real life innovations do. Should some of the dimensions be pre-eminent? For example, does everything depend, as some writers have indicated, on the prior and precise specification of goals (an aspect of task specification)? Or does it depend on the availability of finance - as teachers' organisations invariably argue? Have important aspects been disregarded? There are undoubtedly other questions too.

The PQIE study adopted some procedures and obtained a number of results that bear on these points. In the early planning of the project it was thought appropriate to further subdivide the process of innovation into five stages. The intent was to refine the research model, make the analysis more focussed and fall into line with a widely held RD & D view that the process of innovation must go through a certain logical sequence.

Stage I <u>Identification of the problem</u> - the point at which the dissatisfaction giving rise to innovation (or reform) was identified and diagnosed - Berg & Ostergren's "crack in the system".

Stage II <u>Specification of the solution</u> - a rational and necessary consequence of having identified the problem would be a clear and careful statement of an appropriate answer, and from this a prototype solution would be constructed.

Stage III Initial use or trial - the prototype, should, (according to the RD & D model) be tested and evaluated. This process might be highly systematic or quite informal but it seems necessary for success.

Stage IV Implementation (Diffusion) - once tested (and no doubt improved), the innovation would be ready to be spread throughout the system. An implementation stage was therefore regarded as a discernible part of the process.

Stage V Consolidation or rejection - a stage after implementation was envisaged when the innovation either became incorporated into the system (as for example "new maths" has been in many systems) or remained peripheral (as unfortunately "education for international understanding" has in many more) or was rejected, as the early versions of CAI were.

For the purpose of the research and to help "explain" the process of innovation, the eleven dimensions were to be applied in turn to each of the stages, in accordance with the proposition that: the success of an innovation is a function of the provisions made for (all eleven) components in each of the stages in turn. However, before data collection began, it was decided to abandon the entrenched position that the sequence would necessarily be in the order anticipated. Instead, the question of sequence became regarded as an empirical one - order might or might not be discovered. The stages thus became regarded as phases. But in each phase the eleven dimensions were assumed and the questions generated by them were applied.

The results from the study did not produce evidence to support all of the arguments previously advanced and in fact, provided grounds for regarding some of them as unnecessary - that is, if the objective is to arrive at an *explanation* of the success of innovations. Findings did not show that provisions were made in the case of the innovation either to the extent envisaged or in the way anticipated. Yet up until that moment at least, each innovation was succeeding.

The first general finding that bears on the present paper's concern, relates to the issue of the sequential development of the innovation process and the place of rationale. In the seven countries studied, the evolution

of an innovation has not always been a completely rationalised process. While Indonesia did provide a fine example of the R & D model (*diffusion* is yet to come), the amount of systematic "logical" planning in the other projects varied considerably. Consequently, if we are to assume that all will continue to flourish (an assumption yet to be put to the test) then the conclusion warranted is that success of an innovation is not necessarily dependent on a sequence of phases in which: *identification of the problem* is followed by *specification of the solution, trial, implementation* and *consolidation or rejection.* This finding with its implication that a prior and precise specification of objectives is not a necessary condition for innovation, led to a closer examination of the evolutionary process of the seven innovations. That examination revealed a tendency for the innovations to be subjected to "pulls and pushes" generated by the characteristics of the innovation itself and by the context of the education system and the wider community. Survival then seemed to depend on the capacity of both the innovation system *and* the education system to adapt to contingencies. The relevant working proposition was:

> "Persistence of an innovation is a function of its adaptability. The greater the adaptability, the greater the likelihood of persistence."

One consequence of such a conclusion was that the unthinking application of "evaluation by objectives" may sometimes be both fruitless and, if financial support is consequential, unjust and destructive.

Another commonly held belief that came under question was the usually presumed relationship between innovation and the availability of physical resources. The study, of course, could not argue that there is *no* necessary connection between resources and innovating but two examples did illustrate that the degree of provision sometimes thought necessary need not be so. In Ghana, the equipment supplied to the Continuation Schools came to be "split" unofficially with schools outside the project. The project schools and the others were still able to flourish. In New Zealand, the Government supplied funds for the first Whanau House school block but one other school went ahead and made structural modifications to its buildings using its own existing resources and apparently without the need for extra financial support. The working proposition on this issue was however, stated in general terms to encompass more than just physical resources.

> "The persistence of an innovation is a function of the availability of a critical mass of resources (plant, personnel and people). A critical mass deficiency results in failure."

Another issue related to resources and not foreseen in the original specification, was concerned with staffing stability. Innovation research has become quite explicit on this point and the IIEP study tended to confirm it.

> "The persistentce of an innovation is a function of personnel stability - the greater the stability, the longer the persistence."

The conclusions reached in the study about "time" came out a little differently from the original expectation. Very clearly, to do anything takes time, and innovations are no exception. In addition, people want innovation to be spread quickly, and often this is not the case. Consequently, one reasonable question to ask is: "How can time be saved?" The working proposition concluded:

> "The amount of time taken in the innovation process is a function of the sequencing and coordinating of events. The more precise the coordination, the faster the process."

Finally among the general findings of the PQIE project was one that related to an issue not canvassed in the earlier discussions - the viable size of any innovation. The possible magnitude (and degree of penetration) of an innovation had not been a matter of early concern. Given this paper's interest in "reform" however, one tentative conclusions about size is relevant. The working proposition put it:

> "The amount and size of educational change possible is a function of the degree of flux existing within both the education system and the embedding society. The greater the flux, the greater the potential for change."

If further implications for the administration of reform are to be drawn from the IIEP study of innovation, a certain amount of extrapolation beyond the evidence and the events will be necessary. Although some of the projects in the different countries, even all of them, had the potential to become reforms, none has, at this early stage, grown beyond the size of innovation. As innovations, most had been developed to some extent, some had been tested and some were approaching the time when wider implementation was a possibility. One that could reasonably be accepted as of sufficient magnitude to be regarded as a potential reform, the BVJ project in Nordrhein-Westfalen, had been given a structural basis by legislation. All schools were supposed to make the appropriate provision, but the *form* of action associated with that provision - as it were the functional aspects of the reform - as yet remains unclear.

The generalisation of educational innovations: the administrator's perspective

To extrapolate from *innovation* to *reform* entails imagining that innovation is reform writ small and that therefore the conditions thought to be conducive to successful innovation are of the same order (but of different magnitude) as those of reform. The next step then is to take the lines of explanation and argument developed in the preceding pages and draw out their administrational implications.

As a first step in a working definition of administration it will be taken that administration consists of those aspects of a system's operation that are concerned with the management, organisation and control of resources. The latter functions are also usually considered to exist for the purpose of *maintenance, growth* and *improvement*. Necessarily, such functions entail structures. In most systems overt froms of structure (and sometimes covert ones) are discernible. So are overt and covert forms of function (official and unofficial organisation) and effects (latent and manifest). It follows then that any administrative system can be seen as overtly or covertly encompassing identifiable strategies and tactics, as well as the act of planning, again both overtly and covertly.

In real systems, planning and administrative functions may be unclear, their actions sometimes antithetical and the distinction between them uncertain. In theory however, the distinction can be clear cut if planning is regarded as being concerned essentially with the development of plans - whether macro or micro. The planning process itself as an operation, would need to be administered, and the resulting plans would entail administrative action if they are to be put into effect. Planning may also be concerned with maintaining the system, developing it and/or improving it.

The main thrust of the argument that follows is that the administrative provisions necessary to *develop* and *improve* a system are in some crucial respects different from those necessary to *maintain* the system. In other words, if innovation or reform is wanted, existing administrative structures and functions are unlikely to be adequate unless the *system has made deliberate provision for the development and promulgation of change*. Even then, those provisions may be insufficient for dealing with the degree of *massive* change usually associated with the idea of reform. Given the time available, the preoccupation of most systems with maintenance matters (and the investment of usually more than 95% of the annual budget in them), this means that if reform is wanted, then changes in the system itself are unavoidable.

Three issues arise immediately which concern the conditions to bring about change, the magnitude of the change necessary and the nature and form of the specific changes to be made.

In the case of the first issue, there are two logical alternatives: the change can be induced either voluntarily or involuntarily. It could come about as a deliberate attempt by the system to make administrative provision for undertaking reform, or because the system has been "overthrown". In the latter case it is problematic whether an "overthrown" system (Illich & Friere notwithstanding) would generate administrative structures that would make continuing provision for reform once the immediately desired specific reform had become achieved.

Second, the magnitude of the change necessary probably depends on: (i) the degree of reform needed; (ii) the extent to which any administrative provisions already exist for surfacing, developing and implementing innovations or reforms; and (iii) the extent of flux in the embedding society. For example, it was apparent in the IIEP study that with respect to innovation, education systems in the developed countries tended to adopt a "reactive" stance while those in the developing ones favoured a pro-active one. The established, developed countries were more concerned with "fine tuning" their systems, with waiting for a problem to emerge, and then in reaction, "adjusting" to it. The new, developing countries were more concerned with finding a prototype towards which their system could be directed, i.e. they were giving more attention to thinking ahead.

Third, the nature and form of change needed, depends essentially on the strategy of innovation and reform employed. This appears to depend on the organisational structure of the system and the model of change favoured. To that extent administrative provisions for reform in systems which are centralised, regionalised or decentralised would need to vary. Similarly, the adoption of the "top-down" innovation model or the "grassroots" one would lead to the need for different administrative provisions. The first implies a relatively formalised and elaborate structure with many tasks clearly differentiated. The second implies less structure and greater "facilitative" provisions that will permit, promote and encourage change to happen spontaneously.

As to the administrative provisions that might reasonably be expected to be required in any system, first, as mentioned above, there ought to be provision for the generation or acquisition of appropriate reform ideas.

In another paper, the author has argued for the deliberate setting up of a small "organisation" or unit that is given a mandate to scan new developments elsewhere and simultaneously monitor its own system to discern points of stress and note any novel developments occurring spontaneously (Adams, 1974). It would thus have an eye on developments in the world and at home. Second, again as the earlier pages argued, there ought to be provision whereby reform ideas worth consideration come under examination and evaluation for approval or rejection. This procedure, essentially a political one (in the broadest sense) entails not only the establishment of communication links between critical parts of the system, it also requires the legitimation of the necessary process of communication and negotiation. Whether there needs to be a permanent formalised structure to achieve this purpose or whether the task can be undertaken as an adjunct to an existing agency is arguable. While some systems do make quite deliberate (though sometimes transitory) provisions of such a kind, none apparently undertakes the discriminatory network analysis alluded to earlier: the task would be a relatively substantial one.

The third administrative provision thought necessary, bears on the scope permitted within the system for specific innovations and reforms to develop, i.e. the opportunities provided for new ideas to be worked out in practice. If Havelock & Huberman's notion that innovators or reformers create their own system - a system within a system - is accepted, it follows that it would be subject to all the pressures and strains that any system faces and would need help and sustenance too. In decentralised systems this may only require that those in authority legitimise (and perhaps encourage and support) people who are willing to try novel approaches. In centralised systems however, the most appropriate model may well be the complete RD & D one. Either way, if fruitless effort is to be avoided, the development exercise needs to be a "protected" activity undertaken in at least moderately congenial conditions.

But not only does the innovating system itself have to develop its own identity and integrity, sooner or later it has to intrude into other sub--systems, thus a fourth administrative provision is entailed. This is where the boundaries of conventional thinking about educational administration are most directly challenged, where implementation of the (developed) innovation is involved, and where, failure if not inevitable, is most likely. This is also where least provision is made. Many researchers, prominent among them

Havelock & Huberman and Fullan & Pomfret, have documented the hazards that face an innovation as it ventures out from the comparative safety of the development phase into the deeper waters of implementation. It seems unquestionable that far more elaborate procedures have to be set up to deal with the exigencies of implementation. A new structure, comprehensive enough to accommodate sub-units responsible for each specific innovation is required. It seems unlikely that a universal implementation structure would be suited to the varying characteristics of different innovations and the client systems they will service, unless it is internally differentiated. Whether the system is centralised and top-down oriented or not, is beside the point. Without provision for the enhancement of the process of implementation (diffusion in a decentralised system) the spreading of the innovation will certainly be slow and laboured and may well be imperilled.

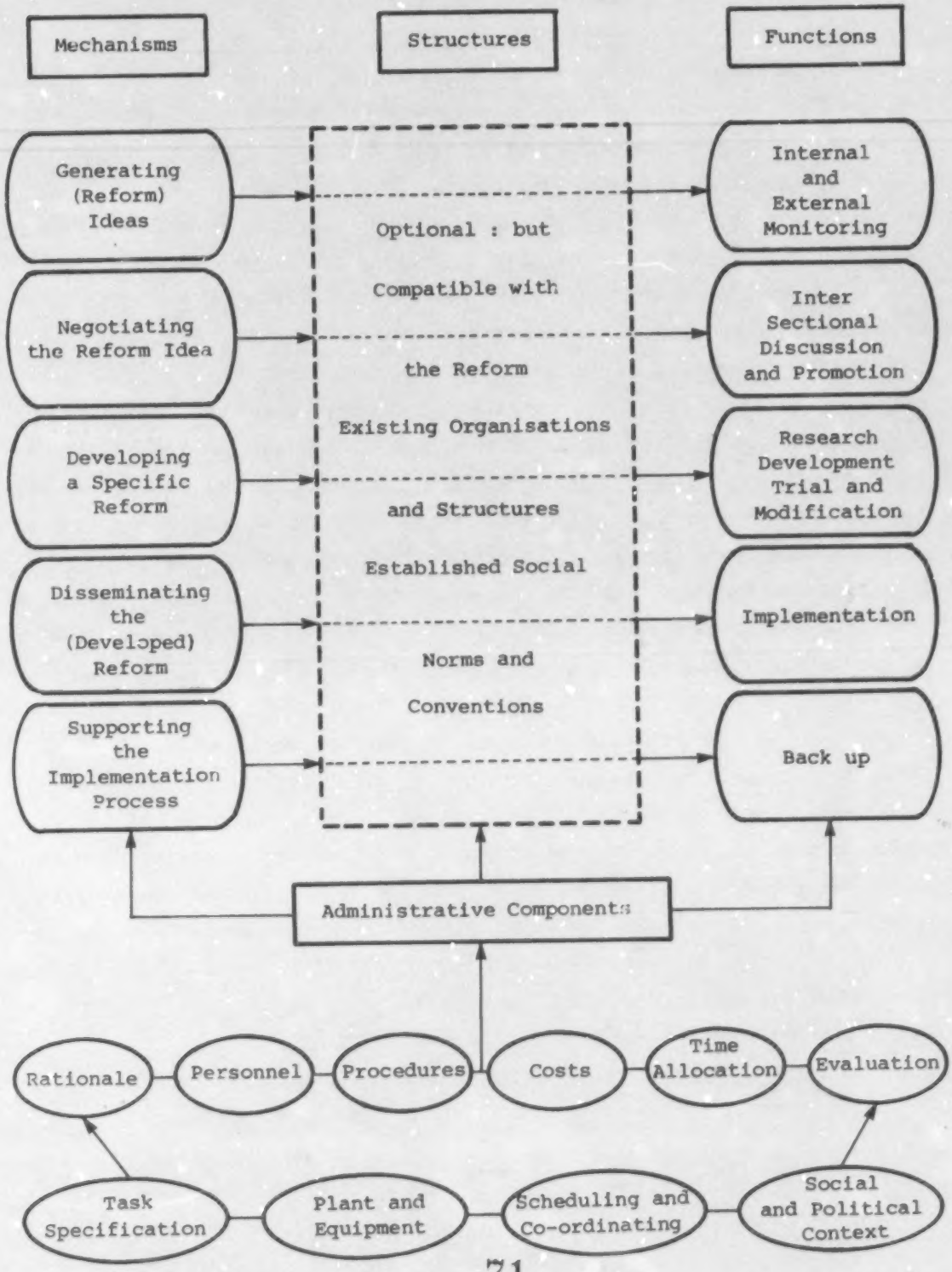
The research also indicates quite clearly that the *main* function to be accomplished by such an organisation is to cope with the interstices between sub-systems - to breach and redefine boundaries between cells and, in the process, change their composition. The task is to provide access to the innovation or reform for those whose ways are to be changed and, to do so in such a way that most benefit and least damage results and so that the change in behaviour does in fact come about. This entails not only providing practical support, both human and material but also providing the degree of psychological and social support that has been found time and time again to be necessary.

If such structural provisions are made and their broad functions accepted, then the main administrative task remaining is to ensure that they work. Here the conventional problem of first, planning and second, administering any sub-system is involved. Accordingly, general principles of planning and administration would apply, which need not be dealt with here. However, there may be some point in drawing attention to one aspect of the PQIE project which was forced to generate its own substantive system categories, because of difficulties experienced in establishing satisfactory dimensions for an education system. The eleven primitive categories generated below (despite the failure of some of them to feature in some *explanations* of innovation), do appear to be useful for planning and administering reforms. They can be stated as a series of prescriptions.

Provision should be made for: making the *rationale* explicit

: specifying the *tasks* to be done

Figure 2. Administration of reform



: providing adequate *personnel, plant* and *equipment*

: determining what *methods* or *procedures* to follow

: meeting *costs*

: *scheduling* and *coordinating*

: budgeting for *time*

: undertaking political and diplomatic negotiations with other related *contexts*

: monitoring or *evaluating* the process and providing feedback.

What this implies is that when a mechanism for "generating" reform ideas is wanted, care should be taken to see that the requirements of each of the prescriptions are met - that the rationale is explicit, the tasks are specified and so on. Similarly, when activating the other mechanisms viz. Negotiating the reform idea, Developing a Specific Reform, Disseminating the developed reform and Supporting the Innovation process, due regard should be given to each of the prescriptions also.

Figure 2 contains a pictorial representation of the argument, the mechanisms are listed on the left, the functions on the right, while in deference to the individuality of different systems, the intervening structures are left unspecified. At the bottom the ten prescriptions are listed "Administrative". The latter are interrelated. Collectively, however, they can appropriately apply to the Mechanisms, Functions and Structures when attempting to provide administrative essentials.

Finally, as a caveat, the point should be made again that the conclusions reached do, in fact, constitute extrapolations from research into innovations some of which are yet to be completed. Nonetheless, most of the deductions are consistent with other research done in the field and as the product of research itself can perhaps claim some authenticity.

ADMINISTRATIVE PROBLEMS IN THE GENERALISATION OF INNOVATIONS

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I. Innovation and administration

One rarely encounters, in the actual practice of educational institutions, the logical sequence by which an innovation ought to be introduced: i.e. design, testing by means of one or more pilot projects, development, generalization. Although much of any innovation's dynamic derives from the hope that it contains the seeds of a satisfactory solution to some serious difficulty or other that affects the educational system, many never get beyond the experimental stage. The experiments themselves are often repeated over and over again, at different times and places, without it ever being possible to be certain that each one has benefited from the lessons learnt from past failures, for want of the right kind of evaluation, sometimes even through ignorance of earlier experiments. Other innovations are generalized after only skimpy experiment. Educational administrators have institutional or organized memory, in general, of their trials and errors, and usually innovations are introduced more in response to fashion or prevailing political pressures than as the outcome of a deliberate plan to systematically test and evaluate new ideas with the explicit aim of applying them, in the fullness of time, to the entire educational system.

The failure of an innovation, i.e. in particular the fact that it is not rapidly generalized, is frequently attributed to administrative problems and red-tape. This kind of sweeping judgment is heard frequently, and while it tends to ignore practical considerations, it does confusedly harbour the germs of some more general truth. Such judgments do not bother to spell out what they mean by innovation, failure or administration even. After all, even glaring failures may be regarded as an often inevitable,

useful even, stage in a systematic process of experiment, always provided that it is accompanied by precise evaluation. In educational as in other matters, denial of the "right to make mistakes" and the need for uniform general rules deduced from legislative principles, hamper the application of experimental methods to the creation and development of new institutions that would foster the learning and personal development of everyone involved in these institutions.

"Administrative" barriers are only partly attributable to the administration itself. The word administration embraces some very clearly-defined activities such as accounting, personnel management, or the publication of laws and regulations, for example, but it also has a much broader meaning, covering everything in schools that is not strictly educational: discipline, parent-teacher relations, leisure activities, as well as everything that goes on outside the school, such as dealings with local authorities, with officials, professional or parents' associations, and so on.

It is the job of the administration to provide for the running of schools; it must organize their day-to-day activities, lay down priorities, arrange timetables and courses, distribute funds and allocate staff. All these decisions touch upon individual and collective interests, and are thus subject to all kinds of economic, political and psychological pressures which influence the way in which the administration organizes itself and establishes the criteria by which it plans to act. The administrative problems connected with the generalization of innovations are thus to a large extent sociological problems rooted in the socio-economic and political context in which education is administered. Here, however, it is intended to only deal with some of the problems that mould administrative styles and attitudes (Chapter II). These represent a synthesis (being different for each country) of all the various influences, historical and contemporary, that are brought to bear on the administration. But administration creates for itself some margin for manoeuvre that adds up to more than the mere result of external pressures, and the following chapter takes a look at problems connected with the broad policy instruments available in the administration's arsenal: legislation, regulation, organization (Chapter III), money (Chapter IV), and human resources (Chapter V).

It is not the intention to consider questions connected with administrative centralization or decentralization, for on surveying not just the formal organizational structures or the legal distribution of powers, but

also all the various influences to which the administration is subject and how it actually works in practice, it is discovered that most administrative structures appear to be mixed in fact, with varying proportions of central control and authonomy depending upon the sphere of activity, regions, tradition, and the personality of local officials. The successful introduction and generalization of innovations certainly implies some modifications in the balance of powers, but it is not necessarily possible to lay down in advance what in general these should be, leaving aside questions of national and local context or of the stage of development at which innovations happen to be.

II. Administrative attitudes and styles

Administrative problems connected with the generalization of innovations are those of launching the innovation and its maintenance. Such activities call for an administration capable of adopting an experimental approach and a style of action that leaves room for self-assessment and sufficient flexibility to put mistakes right, capable of responding swiftly to environmental reactions, and of trying out several different approaches. Administrators often have great difficulty adopting this type of behaviour, which is more readily that of an engineer than of an educationist or a lawyer - two categories of specialists which generally occupy most of the responsible posts in educational administration. Far more frequently, their behaviour carried the heavy stamp of tradition; their efforts are bent towards devising stable rules, modifying them as little as possible and only where inevitable. These rules may take the form of laws, regulations, organization charts, or procedures. They spare executants the need to think for themselves or act on their own initiative, and guarantee users a fair measure of equality of treatment; their application is overseen by one or more corps of inspectors whose duty is to ensure compliance with norms rather than to encourage and develop initiative.

A single administration may in this way contain numerous highly compartmentalized administrative sub-systems, each the outcome of its own historical tradition and having its own sociologically specific clientele, each defending its specificity and its means of action. The Minister and his advisers alone have the opportunity to see the overall picture and take the necessary steps to reform their administration in such a way as to break down these barriers. But they are hampered in this by the power and the

permanence of these sub-systems, and by the pressure of day-to-day decision-making, which inhibits the urge to reform. The outcome is a juxtaposition of different administrative bastions, such as technical education, high schools, higher education, and so on.

As long as the main task of the administration is to solve large-scale problems such as the building of large numbers of schools, the recruitment and training of large numbers of teachers to cope with increases in the duration of compulsory education, a system of strict, all-embracing norms offers many advantages. For example, precise construction norms associated with standard school designs may help shorten construction schedules, expedite the work of architects, cut costs and ensure minimum quality standards.

Once basic needs have been satisfied, more qualitative concerns come to the fore: defects which are not corrected by global measures, such as regional and local disparities, begin to take on more importance. It becomes clear that it is necessary to give greater weight to the specific characteristics of regions and establishments, since their school-age populations and socio-economic environments are often very heterogeneous. This calls for greater local initiative and autonomy for easing the constraints of hierarchy and shifting the emphasis of control which may henceforward take the form of evaluation, advice and training, rather than mere inspection of compliance with formal rules.

Where premises are concerned, for instance, greater architectural flexibility may be sought, or better adjustment to different teaching methods and greater contact with other sections of the public. Curricula might be so designed as to leave greater freedom of choice of content, progress, methods and so forth.

The devleopment and generalization of innovation entails preparing all the people involved and leaving schools greater freedom to manoeuvre, but it may also involve some very directive action on the part of the central administration. However, the call for greater autonomy may also reflect not so much a desire to create a climate favourable to innovation as difficulties encountered by the central administration in resolving on a global scale the contradictions born of a lack of consensus on the goals of reforms. In that case, this would amount to a strategy of circumventing uncertainties and of shifting onto local officials' shoulders the responsibility for resolving the resulting difficulties, with the central administration reserving the right to sanction mistakes later on.

The generalisation of educational innovations:
the administrator's perspective

For effective, continuous action, the administration needs clear principles and simple rules to work to. In any effort to generalize an innovation, administrators will see things differently from experimenters: their task is to try to translate the broad outlines of this innovation into simple terms easily assimilated by the administration and by all those, professionals and parents, to whom the term innovation means little, or even something disagreeable, and whose sole concern is to see things running smoothly, without conflict, just as long as it provides them with a minimum of satisfaction. Their efforts are devoted to causing the least possible upset in the existing distribution of roles between the different departments and professional bodies, and to obtain the consent of the greatest number.

The advocates of the generalization of an innovation, on the other hand, should their innovation fail to offer the universal answer to some crisis that is plain for all to see, and should this innovation thus fail to obtain majority support, would be best advised, if they wish to achieve their aim, to show that this innovation is in fact part of a tradition, that there are precedents for it and that it accrods with the principles of those who claim to be or who think themselves opposed to it.

By adopting this line, administrators and innovators may manage to broaden the circle of people favourable to the spread of an innovation, but they thereby run the risk of deforming the objectives and methods they wished to generalize. It then becomes very tempting to apply the term "administrative obstacles" to what is in fact merely the practical application, in a climate more or less tinged with indifference and hedged with restrictions, of new measures by people, be they professionals or users, who had never been ardent advocates of the measure, merely docile, more or less reluctant, executants.

Lastly, we must bear in mind that politics, routine administration, experiment and research all proceed at a pace of their own, all obey logics of their own, not always mutually reconcilable. Politicians look for ideas and achievements that they can rapidly exploit and hold up before public opinion and the voters; they try to coincide as closely as possible with immediately expressed needs and, at best, with needs likely to be expressed in the not too distant future. They are generally at their most effective neither at the start of their term of office, which is a period of observation, nor towards the end, when they have to move cautiously and are disinclined to make any potentially risky moves, unsure even of being around to

reap the fruits should there be any, while at the same time knowing that it is they who will have to cope with the snags.

Managers stand for continuity in the educational system; their concern is to ensure that minimum standards are adhered to in the educational services offered to parents, and to ensure respect for generally acknowledged traditions. They look for the highest common factor as between the variety of needs expressed in their routine decision-making. They are mistrustful of half-baked ideas, of constant chopping and changing from one project to another, or sharp policy switches; they like to wait until new ideas have garnered a sufficient body of support, a sound basis of respectability, and sufficiently widespread and steady political backing, before agreeing to throw the weight of their authority into the balance to persuade the administrative machine to work wholeheartedly for the accomplishment of these new ideas. They are afraid of being dragged unwillingly into ill-conceived, poorly-planned, ill-suited spending schemes; of being caught up in personnel disputes; of being given responsibility for investment schemes that might prove difficult to sustain; all those problems for which they, not the initial promoters of the innovation, will be the principal, perhaps even the only, people really responsible. Standing in the middle, caught between the innovators, the big professional associations, parents associations, and the politicians, they prefer to wait and see, keep a low profile, adopt an attitude of critical detachment, before allowing themselves to become involved in decisions that may prove very difficult to reverse.

Innovators and experimenters are mainly interested in the success of their experiments and the social and educational returns they predict for them, rather than the practical conditions under which they might be generalized. So they may well complain at having to rush or simplify ways to apply their experiments on a broader scale, and may overestimate the ability of educators and parents to accept and assimilate their ideas. They may sometimes feel they are being forced into improvizing to the detriment of ideal experimental conditions or that they are being dragooned into the service of objectives which may happen to be politically opportune but which are not really their own goals, deforming their ideas and perhaps even compromising their chances of success. Sometimes, on the other hand, they may feel they have been kept waiting too long in the wings, unfairly, and that the time is now ripe for the generalization of innovations that have already been successfully tested.

III. The impact of the generalization of innovations on the regulatory powers and structures of the administration

Innovation may directly affect the formal balance of power between the different echelons of the administration (attempts at decentralization or devolution) or between administration and schools (the setting up of parents' committees or the strengthening of their powers, for instance). When it touches on the curriculum, staff training, the use of new materials, etc., it also has indirect consequences for the balance of practical powers and upon the most appropriate style of behaviour and authority. For example, in France, one innovation entailed freeing a portion (10%) of schoolchildren's time from the programmes laid down by the central administration so as to give schools the possibility of developing contacts with the surrounding community, leaving them free to devise educational activities as they saw fit. Or again, a one-year pre-vocational class was set up for school-leavers completing their compulsory schooling, the exact programme and methods to be used in this class being only very loosely defined by the central administration. Schools were expected to use their initiative in organizing contacts with the outside world, in devising programmes suited to the specific characteristics and needs of their pupils, and so forth.

Innovations such as these implicitly assume a total change of style when introduced into a school system accustomed to precise, rigid regulation of programmes, timetables and methods. So long as they are conducted by volunteers, initiative flows from their own dissatisfaction with the existing situation: they thus furnish themselves with an opportunity of learning new kinds of relations and new patterns of behaviour. When the time comes for generalization, though, the need for initiative is by no means so widely felt. Even where the new regulations are confined to supplying a general framework and explicitly require people to use their initiative, these people still demand instructions as to how to use their new found autonomy, thereby assisting those in the administration who are hostile to innovation.

Many people learn to act autonomously by participating in an innovation; for others, this requires proper training; but because of the shortage of sufficiently mature proving grounds and qualified instructors, such training is often restricted simply to being given information about the innovation.

By substituting very general guidelines and encouragement to act autonomously for precise regulations that spell out everything in detail,

innovations that entail some decentralization of initiative thereby increase the burden of organizational work to be done locally and thus presuppose improvements in administrative training. The administrative function of school heads is enhanced, and their direct responsibility towards parents and teachers is greater. School heads are teachers themselves, but their selection from the ranks of their fellows must now obey different criteria, for the qualities required of them are no longer quite the same if they are to perform more as leaders and organizers than as mere executants of detailed instructions. Here too, the establishment of a new style of relations between school heads and officials, parents, teachers and the local authorities takes time, and may transform an innovation during its generalization.

Usually, the generalization of an innovation entails some *reorganization of the structures* of central, regional and local administration. An innovation that is conducted on a small-scale, in a restricted number of pilot schools, may well call for no more than a small administrative unit with access to the Minister or the head of planning. The resources required will be marginal compared with total resources, and other ministerial departments will be able to go on functioning and managing practically all the available resources in the routine manner. The number of new problems raised by innovations is not so great as to dictate major organizational changes.

On the other hand, any generalization of an innovation that entails major changes in the structure of education, or in the deployment of resources, is bound to call for the creation of new organs of management and a redistribution of roles between existing organs. For example, an educational system that clearly distinguishes several types of secondary education, each with its own clientele, its premises, teachers and methods, will in general have its own corresponding administrative structure with separate departments in charge of running the corresponding groups of resources: teachers, premises, material and so on (for instance: departments for upper primary education, short secondary and long secondary education, and yet another for technical education). Officials and staff of these departments will usually themselves be the products of the schools and the schooling they are managing: they will act as spokesmen for that level of education inside the central administration - as much, or perhaps more so, as the representatives of the schools. If this situation is the outcome of a long historical tradition, then the coordinating structures, e.g. top administration and coordinating officials, are liable to be fairly weak.

The generalisation of educational innovations: the administrator's perspective

An innovation concerning, for example, the reorganization of secondary education by substituting a single comprehensive school for vertical compartmentalization between several different types of school would entail, if generalized, the merger of the different departments responsible for the running of programmes, management of personnel and material resources for each of the existing types of school, or at least to begin with, it would entail a considerable strengthening of the existing coordinating bodies. This altered central organization ought to entail a corresponding local organization. Similarly, at each stage in the reorganization there will arise specific problems whose implications go beyond the innovation itself, which either existed in embryo only, or were simply not perceived when the innovation was being prepared.

Another example concerns the decision to generalize the large-scale use of industrial educational aids such as television and computers: this would require the formation of a specific department. Since training and changing the behaviour patterns of teachers are vital to the successful use of these media, this department would have to participate in the training, perhaps even the recruitment, of these teachers, and it would take some time to achieve a satisfactory balance of spheres of competence between this new department and the personnel department.

As with planning in general, the administration of innovations cannot long remain isolated from the organs responsible for routine administration. It is doubtless essential to set up specific administrative bodies to supervise the introduction of new projects and methods until they have achieved a certain threshold of credibility and acceptance. Subsequently, though, generalization must entail close collaboration between every part of the administration, and often even its complete overhaul.

Specific difficulties attach to the period of transition from the old system to the new, even when professionals and public opinion alike are favourable to it. As long as an innovation has not been generalized it will be necessary to earmark sufficient resources for the simultaneous pursuit of the old system (for instance, a certain type of class or teaching method) and introduction of the new. Provision must be made for pupils who transfer, e.g. those who have changed their place of residence, between schools applying the innovation and traditional schools, so as to ensure that all pupils throughout the country receive equal treatment and that parents' fears are allayed. Training must be provided for a sufficient number of

teachers without disturbing normal school classes. The aims and the methods of the reform must be explained and measures taken to obtain a satisfactory degree of commitment on the part of every actor in the educational system. In this respect, attention should be paid to differences in perception of the objectives and necessity of reforms, and in assimilation of new methods, that arise between the different layers of responsibility in the educational system. It often happens that new ideas, projects (for example a new teaching method for a given subject, a new type of class designed to bridge the gap between school and work for school-leavers) may provoke controversy within small circles of people, without this having any effect on the schools themselves, or that the central administration may do an about-turn on some concept just as it was gaining acceptance and beginning to be applied by teachers in schools. Too many such occurrences will breed indifference and scepticism, which lie at the root of many of the "administrative" obstacles to the generalization of new reforms.

IV. Financial consequences of the generalization of innovations

In the present climate of restricted growth in educational spending, one important criterion by which administrators and finance officials assess the desirability of innovations and their generalization is low cost, or alternatively a reasonable prospect of savings compared with existing methods. They tend to be far more sensitive and receptive to arguments showing that costs will not increase or may even fall, than to arguments designed to show that for a given or higher cost pupils will derive greater educational benefits. This is because the latter type of argument generally stems from cost-benefit analyses, which tend to be more controversial than the simple observation that spending has either remained stable or risen, regardless of the results. Such arguments seeking to mingle such varied considerations as cost, teacher-pupil ratio, school results, degree of consumer satisfaction, etc., confuse the promoters' hopes for their innovations with scientifically established facts, and amount to "advocacy planning" as much as to evaluation. Appreciating the returns on educational innovations is very much a question of gambling on the future. At least in the early stages, most innovations in fact incur additional expenditure, one reason being that they do not completely replace, but juxtapose traditional methods and structures.

Furthermore, certain categories of spending entailed by innovations, such as new architectural concepts for school buildings, workshops, language laboratories, educational TV, and so forth, only become fully effective when combined with other forms of expenditure, and with other administrative and educational methods, not all of which are necessarily provided for. For example, the choice of a type of building or materials entails not only expenditure on investment and renovation, but also subsequent maintenance and running costs which are not always assessed quite as accurately as they might be when the initial investment decision is made. This shortcoming may be the result of insufficient prior planning or quite simply the fact that the financing of these different expenditure items is the responsibility of several different departments. Thus, for example, a language laboratory may be left partially idle for want of technicians to maintain it, because wear and tear has taken its toll faster than expected, or because of a sudden rise in the cost of current teaching aids, recording tape, and so forth. An over-enthusiastic view of educational technology may have dictated a decision to generalize the use of new equipment without giving sufficient prior consideration to the problems of adapting and training teachers in the proper use of these aids. Not infrequently for one or another of these reasons, new teaching aids are left unused, equipment is left unrepaired, or such aids are used in an utterly traditional teaching setting: consequently, they cannot produce the increased educational returns which had originally justified their acquisition.

Perfectionism too may hinder the generalization of innovations that involve the use of new material: for example, when people in technical education demand facilities comparable to the most up-to-date industrial standards, they run the risk of entering into a ceaseless spiral of modernization, in which equipment that would have been highly effective for teaching purposes, given the right kind of methods, is prematurely discarded.

Even if in theory a reform planned on the basis of experiments is not expected to demand additional resources, but rather to result in a redistribution, in practice it is very difficult to achieve such redistributions and to keep costs under control without generating tensions liable to handicap the reform's chances of success.

V. The human factor in innovation

The importance of human relations has been an underlying factor in all of the foregoing. Most people who become involved in innovation are volunteers.

However, the generalization of innovation will involve a far greater number of people, not just volunteers, but also the indifferent and actively opposed. Because of their lack of commitment, it may prove necessary to spell out objectives and methods in much greater detail and to resort to greater formalization in order to make up for the foreseeable lack of initiative in implementing the reform. The fact that not everyone involved in the different phases of generalization is equally committed may generate a need for material incentives, which will further increase costs.

In fact the problem of generalization of innovations raises the question of voluntary action right from the outset. Is it preferable to rely chiefly on volunteers, who will all be highly motivated by the project? Should the families involved be volunteers too, agreeing to allow their children to be used as guinea pigs? Or, on the contrary, should the innovation be implemented in a framework as close as possible to normal school conditions, with pupils involved being neither volunteers nor selected in particular, with teachers being recruited and appointed in the same manner as in any other school? Would it be better to refer as little as possible to "experimental" schools? Both these extreme points of view have their advantages and their drawbacks, both at the moment when the innovation has proved successful and when the time comes for its generalization. In the first case, one is more certain of the dynamism necessary to the healthy development of the innovation; evaluation and corrective measures will be better accepted, in principle; the innovation will be able to produce its effects, and these can be analysed, in a more favourable climate. But the environment in which the experiment is conducted will also be more specific, and this may not necessarily yield many pointers as to future acceptability in the vast bulk of schools.

In the second case, the innovation's development potential may appear to be more limited at first sight, but at the same time conditions will more closely resemble the general situation and will hence be more realistic and, in a sense, more illuminating as to the limitations and real chances of development of the innovation. In practice, one never manages to create ideal experimental conditions, isolating all the variables and outside factors. Indeed, this would not even be desirable, since the gain in quality in the implementation of an innovation would be likely to be lost in the general run of schools, which after all are supposed to be the ultimate beneficiaries of this innovation.

More often than not, in practice it is necessary to combine the demands of the innovators with those of the administrators. For example, experimental schools will be staffed both by volunteers interested in the innovations taking place there and by teachers with no particular interest in them but who, for reasons of geographical convenience, have applied to be posted to these schools through the normal channels. Another example: under the terms of the school map, experimental schools will, under normal circumstances, take children from the surrounding area, but parents may be given the choice of sending their children to a traditional school. The choice of geographical area in which innovations are to be introduced is not without consequences for their future generalization: conducting them in isolated schools scattered throughout the country may help familiarize all the leading regional educators and administrators with the problems associated with them, but this also runs the risk that each of the schools concerned may find itself isolated in a traditional environment. Conversely, an experiment conducted in all schools over a fairly wide area may restrict the opportunities for officials in other zones to familiarize themselves with the innovation, but at the same time it may strengthen its impact on public opinion and develop the innovative capacities of each of the schools concerned, while at the same time facilitating analysis and solution of the problems raised by generalization.

Even in the innovative phase, but still more so when the time comes for generalization, specialists, the unions and the corporative associations are all going to focus their attention on what the reform holds in store for this or that subject, and its likely impact on employment and working conditions. People involved in an innovation, at least in its early phases, are generally motivated by an investigative, interdisciplinary outlook; they are curious and tolerant of what other specialities might contribute to their own teaching. They give freely of their time, without thought of additional advantages or pay, or else make do with some flat-rate payment out of all proportion to the time and work that they actually put in. This kind of experimental, disinterested approach obviously gives innovations a fair measure of flexibility. But this is no longer possible, except in rare cases, when innovation enters the phase of generalization and routine. Reforms that result in a heavier workload are likely to be rejected or to give rise to negative effects that detract from their advantages.

TOWARDS A THEORY OF INNOVATION GENERALIZATION: ORACLE, A SIX-FACTOR FORMULA

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I. Introduction

Every country of the world has made some substantial efforts to improve its educational process in either quantitative or qualitative terms over the last three decades, and for some of these efforts, particularly in the area of basic and vocational education, there have been marked successes. Nevertheless, educational planners and policy-makers are continually bedevilled by the fact that few innovation efforts ever achieve their promised impacts. In 1975 the authors of this paper undertook an extensive analysis of the records and case study reports of a number of innovative projects in developing countries; the study was an attempt to seek explanatory factors and to derive hypotheses regarding processes of educational change and their probable outcomes. Now, two years after publication of that report (Havelock and Huberman, 1978) there has been time to refine thinking and to present conclusions within a slightly revised framework which may be more useful both as an operational guide to planners and practitioners and as a heuristic and hypothesis generator for researchers.

The problem of innovation in education can be subdivided into at least five sub-problems, each of which has been given some attention in the literature, and each of which represents a kind of hypothesis or explanation of why innovation efforts are ultimately disappointing. Perhaps the most prevalently accepted sub-problem is the poor state of knowledge, i.e. the existing base of fundamental knowledge about educational processes such as

learning and teaching is too weak to support any complex or comprehensive reform proposals. A second sub-problem, somewhat related to the first, is the paucity of proven good practices, i.e. existing options for educational reform have no real scientific basis and do not include the kinds of changes that would make a substantial difference if introduced into the typical educational setting. However, for the purposes of this paper, these sub-problems are set aside as issues more related to the content than to the process of innovation.

The three remaining sub-problems are of major concern. One is the problem of developing appropriate intervention strategies for installing innovations. A second is that of sustaining them, and yet a third is the problem of gaining widespread acceptance and use of the innovation beyond the intial adopting site. All three could be grouped together under "the problem of generalization" as distinct from the first two which could be called "the problem of invention".

The purpose of this paper is two-fold: first to summarize the findings of studies undertaken during 1975-76 in terms of six emerging factors which seem to explain much of the phenomena and in terms of four modal patterns of innovation or reform projects. Each modal pattern illustrates a different and revealing configuration of the six factors. The second purpose will be to propose a theory of innovation generalization derived from the six factors, within a general systems framework and time dimension.

II. The evidential base

The 1975-76 study project employed four sources of data as follows:

(a) Case study literature published since 1972

(b) Confidential Evaluation Reports on Unesco Projects

(c) A survey of 81 National Directors and Chief Technical Advisors to approximately 50 major Unesco-UNDP sponsored teacher-training projects

(d) In-depth interviews with 27 persons who responded to the survey along with additional interviews with programme officers in bilateral and international agencies sponsoring innovation projects.

Case Study Literature(1)

Surprisingly, this was the most disappointing source of information, less in absolute terms than in relation to expectations. An intensive search was conducted in three languages for books, journal and newspaper articles and films which would shed light on recent innovations in developing countries. A considerable quantity of documentation was drawn from the International Bureau of Education and Unesco headquarters, as well as from the network of regional centres. The following types of documentation were sought:

- studies which, in general, focused less on the content of an innovation than on the process of its origins and implementation;
- studies both of locally and of nationally initiated projects;
- innovations on which information was available as to whether they received external assistance or not;
- case studies giving a detailed account of the sequence and configuration of events during the life of an innovation;
- studies written by on-the-spot observers, rather than a posteriori accounts on the part of external researchers.

These criteria proved hard to meet. Most reports were found to deal with the content of change (e.g. rural vocational training, use of instructional media, functional literacy, etc.) and very few with the process. There were few accounts of locally initiated innovations; most studies reported either on large-scale projects or on innovations assisted by some form of external expertise and finance. There were no recent internally organized country studies, and fewer summative analyses than anticipated. This situation led to drawing heavily on the few in-depth studies available and relying on the interviews, project evaluation reports and questionnaire responses for the greater part of information on processes.

Project evaluation reports proved to be a rich and untapped source of information. The evaluations had been conducted by teams of experts who have aided the projects, by outside evaluators or by programme specialists

(1) Among works in the case study literature special credit should be given to M. Ahmed and P. Coombs who edited and coordinated the monumental and richly detailed casebook, Education for Rural Development, New York: Praeger, 1975.

of the various executing agencies and foundations, and their reports often contained a good deal of information about the process of change in each case.

A sample of 19 projects of varying types was selected for content analysis. These projects varied greatly in region, duration, form of assistance and level (e.g. in-school and out-of-school; child-, youth-, or adult-centred). From this sample, and independently of the content analysis, eleven projects were further analysed, as to "problems" or "barriers" encountered in the course of implementation. As well as constituting an additional source of information on problem areas, in some measure they served to cross-check reliability of the survey data.

Survey

Neither resources nor time constraints allowed collection of comparative data in the field on the many different kinds of projects which were relevant to this study. However, an opportunity arose to collect data on processes in September 1975, when Unesco convened a week-long conference of Chief Technical Advisers and National Directors of Unesco-UNDP supported teacher-training projects. Projects were from developing countries (52 per cent Africa, 20 per cent Asia, 19 per cent Latin America), of considerable range in size and duration (from 100 to over 50,000 trainees, from less than US $ 100,000 to more than $ 1,000,000 per year in UNDP support), and covering a variety of approaches from non-formal projects to institution building and reform to system reform to curriculum materials production and development. Most of these projects were innovative to some degree and most represented significant efforts to upgrade teacher-training in the countries concerned. The CTAs and Directors were all experienced people in very responsible positions from which they could have observed most of the process issues, and would have experienced many of the "barriers" which are likely to occur at one time or another.

A questionnaire containing 243 items was prepared in the three working languages of the conference (English, French, and Spanish) and distributed. Approximately 90 per cent of those present filled out the questionnaire: the remainder appeared to be either observers or Unesco Headquarters staff who deemed themselves inappropriate respondents. Most respondents completed their forms within one and a half hours, and 81 usable questionnaires were returned, 42 from CTAs and 39 from National Directors.

Although CTAs and Directors came to the conference as two-person teams, they filled in their forms independently and without consultation. Nevertheless, subsequent analysis revealed very few significant differences in the response of the two groups.

The questionnaire

The focus of the questionnaire was the specific project on which the respondent was currently working. Responses were requested to four major sets of questions. The first was purely descriptive data about the project including: duration, number of trainees, type of activity, and level of support both from UNDP and the country itself (all were jointly funded to a degree). The second major set of questions asked for descriptions of the main stages of the project: origins, establishing and publicizing the need, setting objectives, then moving on to planning, acquiring resources, developing participation, implementation, evaluation and finally outcomes.

In a third set of more than 70 items an attempt was made to gather within broad topic areas the most frequently listed problems, or "barriers" encountered in the implementation of innovation projects. This list was unusually broad in its scope, covering historical, political, economic, procedural, social, psychological, and geographic factors.

The fourth and final set of questions presented six clusters of five items, each representing a different perspective or "strategic model" of the innovation process as a whole.

Interviews

This source provided the richest and possibly the most significant information. Well-conducted interviews typically yield more information than questionnaires, and they can also be better shielded from response bias. Our sample of 27 interviewees came in roughly equal numbers from the following populations:

(a) Experts and technical advisers. The sample included people with 10-20 years of experience with different projects in various regions of the world. These people have very often evolved their <u>own</u> theories of how change in education takes place from personal experience.

(b) National project directors, ministry officials and heads of teacher education institutions in developing countries.

These are people with in-depth knowledge of the settings in which innovations occur. They are in many cases the originators as well as the executors of the project.

(c) Programme officers in bilateral and, in particular, in international agencies (Unesco, UNDP, ILO, WHO, FAO, etc.). Having administered many projects and served as advisers for several, these officers had both a detailed knowledge of individual cases and an understanding of the different patterns which characterized projects having similar case histories.

The interviews were carried out by means of a fairly elaborate interview schedule containing both closed- and open-ended questions. The primary objective was to go over in detail the projects which formed the basis for the questionnaires and evaluation reports, but information was also requested on previous projects, other personal experiences and the person's own ideas about innovations in developing countries.

II. O-R-A-C-L-E: The six themes

It will be obvious to any informed observer of educational settings that any set of six concepts will hardly be adequate to capture the richness and complexity of the phenomena of innovation. This fact is recognised but there is a practical necessity to reduce the wealth of data to manageable and coherent sets of elements. The data were diverse and comprehensive, and the modes of analysis, detailed in the 1978 study, were many and complex. Nevertheless, it is felt that this set of explanatory concepts constitute a reasonable and economic set of propositions deserving of further development, refinement, and empirical testing.

But why six themes? In large part, it is a matter of choosing concepts which are broad enough to include many other concepts within themselves. It is additionally an intellectual exercise in choosing concepts which are distinct from one another and represent clusters of variables which are to some degree "orthogonal", i.e. not highly correlated with one another and at least conceptually distinct.

Thus the following six themes are proposed as a summary of the extensive analyses of data at our disposal: (i) Object, (ii) Resources, (iii) Authority, (iv) Consensus, (v) Linkage, (vi) Environment.

O: The "Object"

By the term "object" is meant both the substance of the proposed reform or innovation, and the "objective", the intent of the change effort. Nevertheless both are conceived here primarily in their conceptual form, prior to or apart from their ultimate application in any real setting.

Sociologists who have studied the diffusion of innovations (e.g. Rogers and Shoemaker, 1971) have been able to identify several characteristics of innovations which facilitate or impede their acceptance by a receiving culture. Analysis of our own data tends to confirm previous work, particularly concerning the five dimensions: "relevance", "promised benefit", "resource demand", "complexity", and "compatibility".

"Relevance" refers to the relation of the proposed objective and innovation to the needs of the receiving culture. Often innovations are proposed on the basis of assumptions about needs and the priority among needs which have no basis in empirical fact. Optimally, "objects" should be chosen on the basis of a careful assessment of existing conditions, deficits, opportunities, and capabilities, but it was found that this was rarely the case.

"Promised benefit" refers to the magnitude of impact that the object or objective is supposed to have in improving the status quo in the receiving culture. There was a tendency in many projects to overpromise, leading clients into expectations which could not be realized. The tendency to overpromise is understandable, however, since only projects promising large and dramatic improvements could expect to draw the resources and national attention sought by the innovators.

"Resource demand" is the extent to which the innovation, by its intrinsic nature, requires the mobilization or charge of resources. There are two sub-problems here with quite different implications. The first is demand on scarce resources, such as foreign exchange, petroleum, electricity, or personnel (often foreigners) with specialized expertise, and so forth. This is a typical failing among high technology projects such as those involving television or computers. The tendency is to underestimate requirements and to overestimate the receiving culture's capacity. The other type of resource demand is on local resources, which may be available in abundance but nevertheless demand a significant reinvestment with attendant disruptions of other sectors. These resources will typically consist of people but sometimes also available land, building space or material.

If resource reallocations are both massive and disruptive of other social functions, there will be a strong tendency towards their withdrawal after the initial enthusiasm for the change fades.

The fourth "object" dimension breaks down into at least three sub-categories. First, there is what could be called the "intrinsic" complexity of the innovation concept itself. Included here would be the behaviour and the complexity of behaviour for which change is sought. It would also include the elements that have to be interrelated, e.g., materials in print form, writing implements, audio-visual aids, teacher manuals, classroom redesign, etc. Many of these add to the initial allure of an innovation, but, again, in the longer run, the greater the intrinsic complexity the less likely will be continued use, especially use which remains faithful to the original intent of the developer. A second aspect could be called "social complexity". This refers to the number of different levels and sectors of the society which are directly affected by the change. A new classroom practice or a new curriculum, for example, may affect only the teacher level and perhaps only a few teachers within the level. A new school, on the other hand, involves several different levels, including the district administration. A mandated national programme for functional literacy may involve the educational and other sectors such as business, industry, and agricultural, as well as many layers of government, all levels within the education system, and the citizenry in general. Socially complex innovations are likely to require greater consensus and greater levels of endorsement from authority figures if they are to survive (see "A" and "C" Themes which follow). Yet a third type of complexity is that of the implementation process for the innovation. Usually, innovations which are complex in other respects will also be very complex in terms of the configuration of skilled personnel and resources required for initial installation and demonstration. Moreover, innovations which may appear to be simple in their installed form may yet be very complex from an installation point of view. For example, the establishment of a new teacher training institute may involve no new technology and no significant disruption of the existing educational establishment, yet the initial activities of construction, recruitment of faculty and students, and positioning with respect to other training institutes may represent very difficult tasks.

Yet a fifth dimension of the "object" is compatibility of the objective with crucial attributes of the receiving culture. Thus a major compatibility

problem relates to cultural values; an innovation which stresses pupil competition will do poorly in a culture which stresses cooperation and group dominance. Very frequently, innovations developed in western industrialized countries are seen as not being compatible with local values regardless of their actual merits. A second type of incompatibility results from the prior existence of competing institutions, roles, and practices within the receiving culture. For example, one major effort to introduce a new functional literacy programme for young adults failed in part because it was seen as a threat by supporters of an already existing traditional educational system. A third and perhaps most important form of compatibility concerns the level of development of the culture as a whole. All systems have both cyclic and developmental processes which largely determine when "openness" to various types of innovations will occur. Thus, an idea or an "object" which is introduced at the wrong time is the wrong idea, no matter how well founded and no matter what benefits are promised. This is particularly the case for the introduction of complex technology-related innovations into cultures which are just beginning the process of development into cohesive systems.

R: "Resources"

Here not only financial but also manpower resources are included, the latter can often be used in partial substitution for finances and are always required beyond finances in any case. A third area of resources is "material", often only acquirable with finances but sometimes available in abundance at almost no price or, in other cases, scarce at any price. Finally, there is a most important resource which we call "knowledge" or "expertise", again substitutable for other types of resources such as finances, or sometimes included within other types of resources such as people or material.

The ultimate success of innovations depends to a great degree on what goes into them: ideas, technology, people and finances. The more successful projects, however, did not have more of these resources, but rather had configurations of resources which led to effective implementation and attainment of desired outcomes. They did, however, complain less of serious deficiencies in any one type of resource, be it technical or material. These configurations varied greatly, but all involved an equilibrium between (i) proximate (internal) and remote (external) sources of technical knowledge, and materials or funds to provide more of both; (ii) the timing of resource

acquisition and utilization (e.g., concentrating external support on initial costs or, alternatively, on diffusion) and the type of resources used (information, technical expertise, materials and equipment, additional personnel). A surplus of resources in any one of these dimensions appeared to cause more problems than it resolved. This may attest to the basic equilibrium principle in systematic capacity which, when overloaded, tends towards waste, distortion, paralysis or a reactive tendency to refuse all new inputs. All these outcomes were observed.

In analysing the survey data, three measures were used to judge the magnitude of resources; the amount of the national contribution, the amount of the international or external contribution and the numbers of teachers trained. There was no clear indication that greater or lesser magnitude was related to success in outcomes. The amount of the national financial contribution, however, was related to many other process factors, some of which may have caused the financial contribution to be higher and others of which may have been caused by that contribution. The general pattern of the table presented below is that higher national funding is associated with greater efforts to acquire outside knowledge, as well as with realistic objectives and with more successful replacement of external assistance.

Table 1. Variables related to the size of the national contribution and UNDP contribution (listed in order of magnitude of the relationship)

	National	UNDP
Extensive use of political speeches, newspaper, radio	r = -.45	r = -.01
Acquiring technical knowledge from outside the country	.44	.21
Following a strategy of very open participation and resource utilization	.38	-.01
Following a stragegy of informal channels, opinion leaders, together with media	.37	.05
Use of all types of media	.35	-.09
Project objectives viewed as realistic by respondent	.32	-.03
Project objectives were defined with considerable outside help	-.29	.03
Project has been able to move toward replacement of outside financial assistance with internal finance	.29	.09
Project has been able to replace outside technical assistance with internal personnel	.25	.16

On the other hand, there is considerable evidence from our study and others (e.g. Schramm, 1973) that external financial assistance is a critical factor in initiating, sustaining and diffusing innovations in developing countries by allowing for the creation of "temporary systems" whose creation would otherwise have depleted ongoing programmes. In our sample, respondents who rated the inadequacy of external funds as a serious problem encountered a greater number and more serious problems during implementation. Also, respondents reporting several economic difficulties (inadequacy of internal and external funding, underestimates of costs and inflation, economic problems in the country as a whole) constituted a group plagued by other barriers associated with the burden of a colonial past and the minimal development of indigenous infrastructures (low skill levels, poor interconnections between regions, uncertain and untested political leadership, etc.)

A: "Authority"

Authority signifies the extent to which the innovation effort is sanctioned either in law or by the political power structure. It is a truism that innovations which lack support at the top are always vulnerable. This is especially true for complex innovations and innovations which suffer from one or another form of incompatibility (as nearly all innovations do or they wouldn't be innovations). It is also true that authority support is elusive: leaders attach themselves to causes which appear to be popular at a given time and thus enhance their power but they can become indifferent when other preoccupations arise and even hostile if powerful opposition appears.

Our authority factor also combines leadership at different levels of control, by grouping senior, middle and lower-level authorities. At the most general level, our data confirm many other empirical studies in indicating that senior leadership (e.g., at the national or regional ministry level) is crucial up to the moment of adoption, during critical periods and at the point where diffusion elsewhere in the educational system is being considered. During implementation, the presence of stable and reliable leadership becomes more crucial the closer it is to the focus of implementation itself. Changes, notably turnover of personnel at the district administration level, were less crippling than personnel changes at the project direction level.

C: "Consensus"

Innovations in our sample in which agreement among members on the objectives and procedures of implementation was attained and sustained tended

to have more successful outcomes and fewer damaging obstacles during implementation. This agreement included acceptance of the role modifications called for in the project, which involved both changes in skills and attitudes and, more significantly, shifts in power, influence, responsibilities and rewards among administrators, teachers, village leaders and, in some cases, students. Consensus is, to be sure, difficult to attain politically. It also takes a great deal of time. It involves power equalization among members, which tends to dilute the magnitude of change. Finally, consensus is extremely difficult to maintain over time, since incompatibilities, role strains and competition for limited reasources only surface during implementation. Our study, however, in accord with both the classic and more recent work on organizational change (Coch and French, 1948; Likert, 1961; Hage and Aiken, 1967; Zaltman et al, 1973) suggests that consensus is built through power equilization, via mechanisms for communication and participation, and that it does create attitudes of commitment and "ownership" which can carry innovations successfully through the numerous and serious obstacles encountered during implementation.

In the majority of new programmes and practices in our study, however, officials neither sought nor attained consensus from participating members of agencies. The general perception was that needs were too urgent to be negotiated, and that they could be adequately diagnosed and operationally resolved by senior officials, planning specialists, and external advisors. There was a tendency to assume consensus, and to invoke a rhetoric of indigenous communal reform which suggested wider consultation than was, in fact, carried on. Six successive levels of participation were identified - awareness, being informed, representational consent, direct consent, vicarious participation and full participation - and few projects with initial or continuous participation were found. This practice appeared to have two outcomes. First, lack of wider participation led to reforms which were more radical than might otherwise have been designed, given the degree of psychological separation between those making decisions and those at the focus of implementation. On the other hand, such psychological separation had a negative effect on the magnitude of changes actually implemented. This is a classic finding (e.g. Katz and Kahn, 1966). Data from the case studies, project evaluation reports and interviews indicated that there was a great deal of superficial conformity to the new skill and role requirements at local sites, beneath which institutions or teachers continued

routine practices. There was also a frequent phenomenon of "transferring" the resources from new projects for uses which were more meaningful to the institutions or villages than the projects being implemented. This finding brings to mind a similar pattern observed in the recent Rand Corporation study of federally administered educational innovations in the United States (Berman and McLaughlin, 1975, 1977).

L: "Linkage"

This is the theme which probably carries the greatest burden of meaning in the "ORACLE" formula. Essentially by "linkage" is meant the extent of system development and integration. This begins with the concept of "connectedness" but also includes the quality and complexity of interconnections and the procedural configurations and divisions of labour which result as cultures evolve into more complex and elaborated forms. Another term which could be used to represent this rather complex concept is "infrastructure".

A clear relationship was found between the magnitude of the innovation and the existence of a stable, differentiated and articulated configuration of people, roles, and routines available and mobilized to service components of that innovation. There are three components to this "configuration". The first is the number of interconnections, vital because they determine the path as well as the speed of communication between elements; in many ways, connectedness underlies all other aspects of a system's functioning. The second component could be called the "patterns" or the "routines"; these are the ways in which elements go together and the sequences in which they are connected. It is assumed that effective institutions incorporate routines for internal problem-solving, which maintain stability and at the same time allow growth; they imply the proper linkage of needs and need awareness to problem-solving and adapting mechanisms. A third aspect of this "linkage" concept is the notion of social structure; both connectedness and patterning further imply a division of labour and a differentiation of roles within the system to stabilize effective problem-solving routines and to ensure their maintenance over time. This aspect is what is most often referred to as "infrastructure". Schematically, a good linkage (L+) implies the presence of at least four components: (i) correct definition of needs (e.g. more pupils with basic skills in literacy and numeracy are required for the local and national economy); (ii) correct analysis of the problem (e.g. there is a high drop-out rate, due, at least in part, to the lack of

trained teachers to teach these skills and a curriculum which does not apply these skills to practical problems); (iii) the solution is appropriate and both politically and materially possible (e.g. create a curriculum development unit, a publishing service for the mass production of new materials, a retraining programme for teachers, a recruitment and training scheme for new teachers, etc., and secure the funds, equipment and personnel); (iv) the implementation is rapid and reliable (e.g. authorizations are given in time to organize meetings, purchases and new building projects; materials arrive or time and in sufficient numbers; people have clear instructions or, if not, a means to rapidly obtain them). The last component is particularly crucial, not only because it determines whether and how the innovation will be carried out, but also because it ensures the regular functioning of the educational system, i.e., other innovative projects and all ongoing programmes.

When, on the contrary, there is a weak linkage (L-), the entire problem-solving cycle becomes unreliable. As a result, there are "errors". The more ambitious the project and weaker the infrastructure the greater the likely number of errors, that is, the more likely a great number of unpredictable events will occur in the life of the project. This, in turn, reduces the probability that the final form of the innovation will resemble its original design. Projects introduced into weak linkage situations tend to lurch from crisis to crisis and end up either as "pilot projects" propped up by special resources and unusual administrative support or in some more modest, "reinvented" format which is often indistinugishable from the programme or practice they were meant to supplant. Weakness linkage can manifest itself at various points in the problem-solving cycle:

- in the diagnosis of the need for change, where genuine needs are not sensed or are distroted by the time they reach the planning and decision-making units;
- in the definition of the problem where the baseline data are unreliable or where the educational leadership has fixed ideas and tends not to consult evidence from the field;
- in the solution proposed, which may be inappropriate or impractical;
- in the implementation phase, where the performances of the people involved in the project, the administrative

support and technical machinery are not reliable, i.e. do not provide needed elements in the form needed.

E: "Environment"

Although this concept is extremely broad, the meaning here excludes aspects which are already covered under the five themes already discussed. "Environment" should first of all be understood as a relative and a relational term. All systems are set in an environment of other systems with which they interact to constitute larger systems. Here it refers only to major environmental features which are likely directly to affect the fate of the innovation. There are four such features which are of primary concern: supportiveness, object consonance, stage synchronisation, and turbulence.

Some environments can be clearly identified as more friendly or more hostile to innovation in general or to the particular innovation. This could variously be described as "openness", "supportiveness", "flexibility", or being in a fluid state. It should be noted that a particular receiver or target of innovation effort might be quite open yet exist within an environment which is generally hostile or inhospitable to outsiders and to change.

This could also be viewed as a problem of consonance or dissonance between the objectives of the would-be change agents and the objectives of the larger system. If there is considerable dissonance, the innovati effort is likely to experience trouble.

If, as is generally assumed, systems are constantly in a state of evolution or devolution, and there is a certain rhythm to system activity such that it breaks down into stages and cycles of effort, change efforts must somehow be synchronised with this rhythm, not only in the immediate receiving system but also in the larger social environment of the receiving culture.

Finally, there is a very general environmental attribute which is often underrated but which affects innovation generalization in the most serious ways, i.e. general environmental "turbulence". Its symptoms are very high rates of job turnover, frequent changes in government, frequent and dramatic shifts in public opinion, and a high degree of factionalism and confusion regarding fundamental societal needs and objectives.

As one way to concretize the meaning of ORACLE, the 16 problems or "barriers" reported most frequently from our four data sources have been

classified and interpreted according to the six themes. In many cases, of course, a given problem will concern more than one theme. Perhaps the best way to concretize this part of the model is to look at some of the typical barriers encountered in innovative projects; those which appear with moderate frequency and at least a moderate degree of gravity are the following:

- long distance between places (L-)
- slow transport of materials (L-)
- difficulty in locating and recruiting persons who should have been involved in the project (R-L-)
- lack of interest by political leaders (in particular in external assistance projects) (A-O-)
- lack of good communication with political leaders (A-L-)
- delays in formal authorizations (L-A-)
- insufficiently clear structure for decision-making (L-A-)
- lack of coordination between people in different roles (L-)
- lack of common understanding of project objectives (O-,C-)
- delays in delivery of funds and materials (L-,R-)
- insufficient funds and materials (R-)
- lack of skilled manpower (R-)
- departure and replacement of key persons (A-,E-)
- too rapid rhythm of implementation (inappropriate problem-solving routine, L-, unsynchronised, E-)
- problem of social relations between team members and others (C-,L-)
- significant differences in cultural values (C-,O-,E-)

In summary, the match-up of problems and themes was as follows:

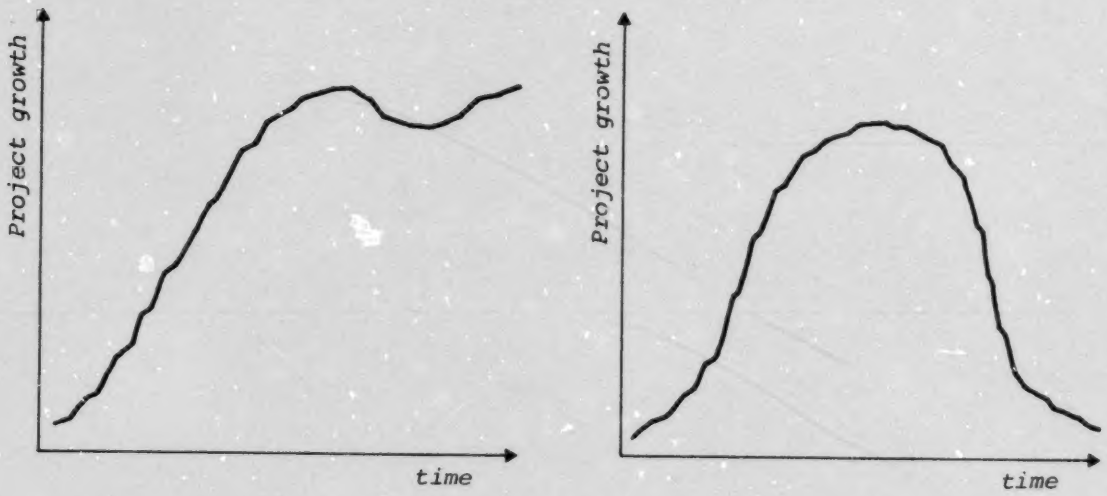
Object:	3	
Resources:	4	
Authority:	5	
Consensus:	3	
Linkage:	10	(a large number of the "linkage" items concern simply issues of connectedness of persons, elements, etc. (e.g. distances, transport, communications, delays).)
Environment:	3	

IV. Four modal patterns with an ORACLE analysis

Very few projects in our study of some 65 educational innovations met all the requirements of our six factor model, but those which showed neither serious deficiencies in any one component nor an extreme disequilibrium between the six factors appeared to have smoother cycles of planning and implementation as well as a more successful array of outcomes. If, however, these projects are classified into a smaller number of groups sharing similar characteristics, no one of these four groups represents a "successful" model of planned change. The successive phases of the problem-solving cycle of each of the four project types are given below.

Type 1: the alternative of grandeur

Figure 1. Growth gradients of the "alternative of grandeur" project



PATTERN # 1 PATTERN # 2

There is a rapid and continuous rise in the size and scope of the project, followed by an equally rapid decline or, more frequently, a rapid increase which gradually tapers off and is followed by a phase of stabilization or, in some cases, of slow decline.

At the base of these projects is a strong desire for radical change, fueled by a number of precipitating conditions: recent national independence, the mobilization of a political elite vowing to meet the country's needs with

indigenous solutions, a widespread desire for "modernization" and finally, economic pressures from neighbouring countries. The survey responses for this cluster show that the opposition of the political and educational elite to the innovation is not perceived as serious, although the projects involve large-scale changes with important shifts in traditional patterns of schooling.

The planning cycle is rapid and often produces a solution involving major national and international assistance and including a technological component (a combination of radio, TV and printed materials). External knowledge, expertise and finance are brought in at an early phase in the planning cycle. Early external input appears to have three effects: (i) there is a tendency to propose ambitious projects involving some form of national or regional centre, rather than a series of local, small-scale projects; (ii) the role of external assistance in the project is significant; (iii) planning appers to be fairly meticulous.

There is little consultation with individuals, groups or agencies outside the Ministry. Prior to and during initial implementation, however, the President of the country or the Minister of Education is likely to communicate the urgency and importance of the project through national media. Although the plan of operations is clear, the objectives are not. Documents may stress, for example the rural vocational focus of the innovation and its link with village employment and continuing education networks. On the other hand, a number of key elements are likely to be missing or very loosely sketched: the age of the pupils, specific retraining requirements for teachers, the relationship with traditional primary schools, precise components of the curriculum, certification, precise links to the rural economy, etc.

During implementation, these projects experience numerous and serious obstacles, many of them unexpected: insufficiencies in equipment, trained personnel, facilities and funds; active or passive resistance on the part of local inhabitants and officials; lack of requisite knowledge and skills on the part of teachers or teacher-trainers, owing presumably to the lack of clarity of the project and inadequacy of prior preparation; weak or inconsistent leadership, characterized by over-centralization, an insufficiently clear structure for making decisions, and by lack of communication between project leaders and political leaders. Authority appears to be concentrated in the hands of a few senior administrators, far removed from the site of implementation and difficult to contact. Finally, there

is a heavy turnover of personnel, notably at the administrative level, which exacerbates problems of coordination, continuity and communication.

Alternatives of grandeur end up as less grandiose innovations; they are typically reduced in scale and resources are channeled elsewhere. External personnel and finance are removed. Often, the project is maintained at the level of a fairly large experimental or "showcase" programme which serves as a demonstration site but which has, in fact, few institutionalized links to the remainder of schools or training centres. In some cases, there is a "phoenix phenomenon" - the project is reinvented in a more modest form a few years later at the local level by a village leader or provincial administrator, generally with success.

This project pattern can be reviewed in the light of the six ORACLE factors as a method of assessing the adequacy of preparation and execution.

O. Much of the force behind alternatives of grandeur lies precisely in the size and rapidity of benefits promised. The projects themselves, however, are far too complex and ambitious to be assimilated locally. While countries sponsoring projects of this nature are systemically "open" to new inputs, they have neither the necessary interconnections nor cohesion to process them successfully. The complexity of the project literally overloads national capacities.

R. Resources in this project pattern are considerable, but unequal to the task of meeting objectives. Finances, staff, materials and expertise rapidly turn out to be inadequate, with an uneven distribution between the large injections of international expertise and funds and the lack of requisite skills and financial-material resources at the national level. Even in the final "pilot" version of these projects, external assistance continues to be necessary.

A. While authority is strong and supportive at the ministerial and presidential levels, it is neither consistently present nor sufficiently close to the site of implementation. As a result, leadership at local levels tends to be eroded or inconsistent.

C. Consensus is low in this project pattern. The ambitious nature and allure of promised benefits keeps enthusiasm and commitment high through the initial phase of implementation, but then tapers off rapidly. As pre-implementation consultation has been rapid, there is no base for continuing support when major problems emerge during project execution. Also, when the initially strong support for the project is examined more closely, it

becomes clear that a temporary consensus has been reached between competing interests and loyalties which gradually become aware of areas of conflict.

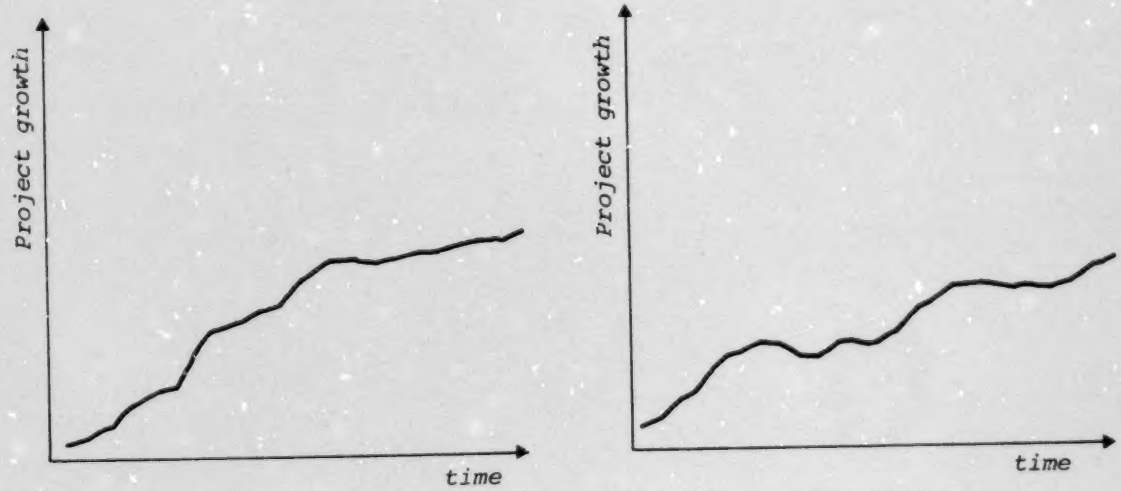
L. As indicated earlier, these regional centres and high technology projects call for a heavy concentration of people and resources which must be serviced by the administration. However, processes of decision-making, communication, transportation and coordination are often too slow or too irregular, resulting in delays and shortfalls. The large proportion of foreign expertise also complicates articulation between units.

E. These projects are executed in an environment which remains flexible and supportive; the reforms are of national importance and seem appropriate in an actively reformist government. However, there are no precedents to attach both perceptually and operationally to a multi-media programme or a multi-purpose training institute. More crucially, the environment tends to be unstable, with frequent shifts of personnel to other sectors and the appearance of shifting political allegiances at the ministerial level.

Type 2: Controlled expansion

The growth gradients of these projects are less dramatic than in the alternative of grandeur:

Figure 2. Growth gradients of the "controlled expansion" project



PATTERN # 1 PATTERN # 2

The project experiences a fairly rapid development, then tapers off and gradually declines in size and scope before stabilizing. Alternatively, this project type can follow another pattern: a gradual but steady development, interspersed with phases of stabilization or regression.

Many of the same educational problems and needs are present here as in the first project type: low productivity of formal schooling in relation to its cost, continued influence of the colonial education system, unmet demands for middle-level technicians, high rates of illiteracy, underdevelopment of the adult education network, etc. However, as urgent as these needs are perceived to be, there is not the expectation that they can be met rapidly or through a series of major reforms. Four indicators distinguish this project type from the first: (i) the greater age of political and educational officials, combined with their longer tenure in office; (ii) the frequent characterization of the social and cultural systems in the target countries as "highly traditional"; (iii) more frequent complaints of opposition to change on the part of the political and educational elite; (iv) far less discontent with the inappropriateness of the colonial educational system than in the first project type. In sum, the educational system is both more stable and less permeable to external inputs.

The planning cycle is rapid and exclusively quantitative. Comparatively less importance is given in these projects to a comprehensive planning cycle, which would include a clear definition of objectives, systematic retrieval of information, pre- and post- implementation assessment using quantitative data, and the use of specialized sub-groups or subsystems for research, planning and programme development.

As might be expected from the above conditions, the form and scope of the innovation are less ambitious than in the first project type. Heavily technological solutions are either ruled out or accepted with a very gradual rate of development. Educational leadership may be more experienced and more cautious and unwilling to launch a major project which cannot be fully controlled. When large-scale projects are designed, they tend to be additions to the present structures (increase in the number of teacher-training institutions or vocational training programmes, etc.) rather than radical changes in the roles of the target public.

As in the first project type, there is an early and significant role of outside finance and expertise. The feasibility of the project has been determined not so much on the basis of a careful assessment of available

resources and administrative or local support, as on the appraisal of senior ministry officials, aided by external advisers.

Unlike the first type of project, implementation here does not appear to be accompanied by a large-scale campaign to publicize and gain support for the innovation. Both project types do, however, share two characteristics: the vague or global nature of the project objectives and the highly administrative mode of implementation. Here again, projects do not appear to have been seriously negotiated in advance at the local level. Rather, they are entrusted for execution to provincial officials.

In the implementation phase, the list of expected and unexpected difficulties is similar to that of the projects in the first category. However, differences in the interaction between such difficulties and the threshold at which they become grave lead to different patterns. These differences in pattern are due to (i) the relatively smaller size of these projects (in amounts of funds and personnel), (ii) their lower level of ambition, (iii) a slightly more reliable infrastructure and (iv) a more consistent structure of authority.

Although consultation has been summary, resistance at the level of application is relatively low. This may be because projects are less ambitious and require less behavioural change. Inadequacies of materials, manpower and facilities are frequently encountered. They result in delays, poor implementation and the use of traditional - and therefore often inappropriate - materials to replace those which have not been delivered on time or in sufficient quantities. These projects are also plagued by the lack of requisite skills and capabilities which have been underestimated in the planning phase. Authority remains fairly strong and stable, but suffers from overcentralization. Also all the procedural difficulties associated with a weak infrastructure are found here: poor coordination, inadequate communication and little delegation of authority, all resulting in delays or confusion. Yet implementation appears to proceed with fewer ups and downs than in the first project type. There are fewer unexpected outcomes and a more rapid return to normality when these occur. This may be a function of the lowered levels of ambition in these projects, but it is also attributable to more consistent authority and to a more entrenched routine for executing projects through administrative channels. Implementation is highly formalized and regulated, with little improvisation or risk-taking. Key actors do not adapt to new situations as much as they

apply existing rules to them. This reduces confusions, aberrations and uncertainties, but also limits the project's adaptability and increases the likelihood of its assimilation to conventional practices.

In many ways this project type reflects both the advantages and limits of Zaltman's consistency paradigm (1973), wherein implementation is presumably favoured by institutional conditions of low complexity, high formalization, and high centralization. Our "controlled expansion" cluster corresponds closely to that model.

The most frequent complaints voiced by project administrators, users and technical assistance experts are predictably "too many rules and regulations" and "people in key roles (are) not open to change in attitudes or behaviours." External experts attempt to bypass the mandated forms of project execution, usually without success.

An ORACLE analysis shows that "controlled expansions" run into fewer problems but also fall short of initial expectations.

O. These projects are, as seen above, relatively modest and easy to install. Their role is essentially to reinforce existing programmes and institutions whose priorities have been fixed for an indefinite period. Foreign advisors may complain of the questionable relevance of traditional sometimes neo-colonial curricula, training establishments and certification, but gain little support within the Ministry or even within district educational offices. Demands on existing resources are also moderate, with much of the funding and skilled personnel coming from bilateral and multilateral agencies.

R. Resources are uneven, expertise, materials and financial resources are concentrated at the top of the hierarchy and in urban areas. When foreign inputs are taken into account, the resources are equal to project objectives.

A. Authority is strong and consistent in this project pattern, but is often considered inflexible and somewhat distant. In fact, senior ministerial authorities often delegate project management to lower levels, but there is a tendency at this level to supervise closely the procedures and expenses connected to a project without a strong interest in substantive issues.

C. Consensus is low in this project pattern, but causes few problems. To begin with, the project involves few serious modification; most project staff stand to gain from the additional resources, and consensus is seldom solicited from junior staff, trainees or community liaison officials, so that the expectation of power equalization is low.

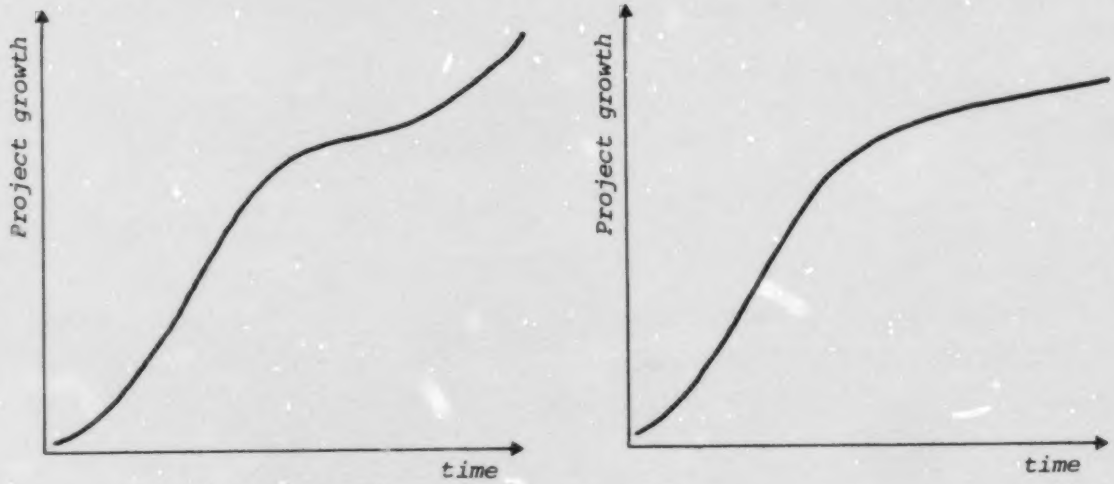
L. Linkage is considered poor but not crippling by national and international staff. In particular, decisions are often concentrated in the hands of a few, sometimes uninformed officials. This leads to delays and to inappropriate instructions for hiring staff, producing materials or revising programme execution; the inappropriateness only becomes obvious at local levels. Similarly, the availability and reliability of coordinating or communicating units deteriorate as execution moves to more remote areas.

E. The larger environment is relatively stable and contains other institutions, programmes and trainees of the same nature. The chief problem here is inflexibility to new ideas or proposed revisions which emerge during planning and execution and do not correspond to codified practices and procedures.

Type 3: The crusade

These are unusual projects, requiring exceptional political conditions. It is also very difficult, given the ideology-laden nature of the data associated with "crusades", to separate bias from analysis. Growth gradients which emerge from that data are dramatic and positive. They depict either a sharp and continuous development or an initial spurt, which then levels off:

Figure 3. Growth gradients of the "crusade" project



PATTERN ## 1 PATTERN ## 2

As noted earlier, these projects are initiated by a charismatic authority figure who enjoys widespread public support and profits from an administrative infrastructure which, although uneven, contains good linkage between national and local levels of execution. The doctrine or policy behind these projects is explicitly socialist or collectivist; the strategy of execution emphasizes self-help rather than external assistance.

In terms of prior conditions, this project type is similar to that of the alternative of grandeur: immense and urgent educational needs, desire for and consensus on sweeping changes in in-school and out-of-school networks. In some cases independence is a recent occurrence and leaders are young; in others, the country has been independent for 10 - 20 years and its elite is older. Problems of internal finance are acute, but the type of project selected for execution may not require a heavy financial outlay, and if it does, the tendency is to borrow funds, equipment and personnel from another lower-priority sector, rather than turn to extensive outside assistance.

In the planning cycle, when needs are assessed and solutions devised, there appears to be little or no "objective" assessment, nor the weighing of alternative solutions. The resulting plan of operations is approximate or indicative - far more so than in the first two project types. This may reflect the absence of external expertise during this part of the cycle. The reasoning of political leadership appears to be that open and frequently used channels of communication to provincial or local leaders will allow for local adaptations. There is then no necessity for a uniform model of implementation, nor for a more comprehensive and rigorous approach to planning which is perceived as gathering and processing information through intermediaries who then translate situation-specific data into de-contextualized projections or central tendencies. Similarly, the inventory of resources during the planning cycle is inexact and incomplete, but the type of solution devised calls for volunteers and donations of materials or facilities in the region of execution. In short, planning is intuitive and informal, and it is carried out with a radically different logic than that of reducing the margin of error in programme execution. The solution devised calls for a large-scale innovation, both in terms of elements and of behavioural changes. These projects tend to be people- rather than technology-centred: adult literacy, vocational training centres, rural education programmes. Most appear to involve the mobilization of learners around a core of instructors,

with both groups often mobile - learners coming for short cycles to centres and instructors circulating locally in teams. This reduces the dependence on large, centralized institutions. It does, however, call for coordinating great numbers of people in a variety of geographically dispersed settings, which is achieved through strong administrative direction and reliance on local leadership, facilities and expertise. This is a configuration which can only succeed either through (i) complex programming and an elaborate, highly reliable infrastructure to manage the number and variety of messages and connections, or alternatively, through (ii) strong and consistent leadership and equally powerful motivation on the part of users. It is the second alternative which appears to operate in the "crusade" project type.

External finance and expertise are not always absent in this project pattern, but tend to appear later in the problem-solving cycle and in lesser amounts. As a rule, it is only when the overall objectives and the basic design for execution have been defined that external assistance is sought. This entails (i) less risk of an international rather than a national solution to the educational needs of the country, (ii) a greater emphasis on local resources which are more dependable, more acceptable to the users and better integrated into the training network, and (iii) less likelihood of the country's becoming dependent on external agencies in subsequent phases of the project. The practice is to bring in small numbers of external specialists or technicians for precise tasks which have been defined in advance. In this way, the foreign expert does not identify as closely with the project, but views himself as a temporary and expendable resource. This in turn, decreases the likelihood of conflict between nationals and internationals within the project team.

Execution is meant to be rapid and widespread. While political and educational leaders may undertake a tour of implementation sites to generate support for the project, the chief strategy is via informal channels of influence: contacts with village and other influential opinion leaders; broadcasts in local dialects; displays in markets, fairs and local cafes, either to stimulate interest and participation or, alternatively to reduce resistance and anxiety. Special agents may also be hired to circulate and inform people of a new project, often by demonstrating its advantages in some tangible way. To judge from the survey and interview data, these techniques of socially interactive implementation are infrequent in all but this project type when large-scale projects are involved. Elsewhere, it is

felt apparently that informal communication is less rapid and reliable than administrative modes of execution.

Finally, the peculiar configuration of the crusade seems to deal more successfully with the problem of soliciting and maintaining major behavioural changes among the target audience than the other project types. By accentuating the presence of a strong and paternal leadership, and by creating an atmosphere of social mobilization, users are encouraged to try practices or to accept instruction of a type with which they are unfamiliar and toward which they may feel anxious and possibly suspicious. The data indicate that this strategy is, at least initially, successful, that is, the target public takes a number of personal and social risks which it would normally have avoided.

As mentioned earlier, numerous and serious problems are encountered during implementation of the innovation, many of which are unanticipated. The project overcomes these obstacles effectively for the most part, by adapting rapidly to new situations. Strong leadership is able to maintain enthusiasm and self-sacrifice. For example, insufficiences in equipment, materials, trained personnel and facilities are all encountered, but without seeming to incapacitate the project. As hoped, local and provincial officials respond to these problems by making available facilities, equipment and, often, funds. Personnel work overtime and recruit volunteers as aides. A good deal of improvisation goes on at the training sites.

Resistance appears to be absent at first, but makes itself felt as teachers, trainees and volunteers confront the first difficulties of learning a new skill or dealing differently with their crops, children, classrooms or village customs. Here again, the basic problem is not deliberate opposition but rather the lack of requisite knowledge and skills to perform these new roles. However, conditions are present to help diminish anxiety or anticipation of failure: the motivating force of doctrine, easier and less critical contact with other trainees and instructors and the latitude to find one's own particular way of learning or teaching the new skills. But the lack of previous training, combined with the pressure for rapid change, may lead to more defensiveness than is often admitted by those running these projects.

There may be superficial or temporary change in behaviours, with a later reversion to the prior (secure, successful) performance at the end of a given training cycle.

These projects appear to have consistent leadership at all levels - institutional, local, provincial, national - each level in regular communication with the others. The control function is further strengthened by high consensus on the objectives of the project. Authority figures come to symbolize the consensus, which in turn facilitates implementation and decreases deviance. As a result, teachers and trainees are obliged to try out new roles for a fairly extensive period, which in turn makes the new behaviours more stable and more difficult to extinguish later.

There appears to be little turnover of key persons associated with this type of project, and little or no change at the ministerial or political levels. This facilitates continuity, including communication with and support from above. There are nonetheless problems of coordination, delays, confusion and too rapid implementation which indicate that the scale of the project is often too great for the infrastructure. With few established routines or regulations to guide decision-making, much time may be lost in discussion of each problem, with bottlenecks being created at the level of local and provincial officials. What is difficult to achieve in this type of project is the coordination between national or ministerial demands and local situations; there are frequent cycles of over-centralization or over-decentralization, both of which inhibit smooth execution.

The key question in relation to these projects is whether the initial rate of development is maintained over time or whether there are subsequent periods of stabilization or even decline, probably the latter is the case. On the one hand, it is very difficult to maintain an atmosphere of crusade and continue to devote large amounts of political and administrative time to an innovation over long periods. The degree of change expected in the functioning of local institutions and in the behaviours of teachers and trainees is so great that the surrounding social and political systems are very likely to reduce the gradient. A fairly high rate of reversion to traditional ways of teaching, learning, planting, interacting, etc. could be anticipated. This, however, does not preclude continuation of the innovation under normal conditions nor even a greater rate of diffusion to other settings than was found in the first two project patterns.

The number of these projects is fewer and the data less reliable than for the preceding project patterns. Nevertheless, the ORACLE checklist helps to pinpoint areas of strength and weakness.

O. To their advocates these projects are viewed as straightforward and simple. However, like the alternatives of grandeur, they are complex and demanding at the operational level. They promise rapid and widespread benefits and put a heavy strain on existing resources. Unlike the first project type, these "crusades" are considered culturally and educationally appropriate, and are compatible with existing social policies.

R. As indicated above, resources of all types are inadequate, both at the start and during later implementation. Equipment, materials, facilities and trained personnel are all underestimated. But "crusades" tend to be labour-intensive, requiring relatively little capital. They also have sufficient popular and ministerial priority to borrow funds or expertise from other sectors. Finally, external financing and training is provided for, although at a lower level and for fixed durations.

A. Authority is a prominent factor, especially in the initial phases when national leaders participate actively in mobilizing local populations. Literacy campaigns or rural education projects often use the name of a national leader in their project title, to ensure support and continuous assistance at the ministerial level. Authority appears to break down somewhat in later phases, as national leaders are occupied elsewhere and project directors are spread too thin in a highly decentralized operation.

C. Consensus is high from the outset and remains fairly high throughout. There are indications of pre-project consultation and the careful building of local support. Project personnel, trainees, community leaders and commercial enterprises are asked to volunteer, contribute or otherwise aid these projects, and there is fairly strong evidence that this occurs, but it is difficult to sort out actual behaviours from rhetoric.

L. Linkage is weak, especially since project implementation typically goes on in remote, disconnected areas with loose central coordination. Decisions and messages get held up or simply disappear. Bottlenecks occur in the preparation of needed materials or the arrival of trainers. There is, however, a surprising amount of successful improvisation at local sites. In many instances, since these projects involve the coordination of large numbers of people but comparatively little equipment, existing forms of social communication (provincial newspapers, radio) are pressed into the service of the project.

E. Crusades are carried out in a highly supportive environment and are often community based or tied in with local economies. These environments

provide additional resources: they are also extremely flexible in regard to the ways local officials and community leaders solve implementation problems. Environmental turbulence is, apparently, marginal, contributing to continuity of staff, leadership and resources. Turbulence is further reduced by the low level of dependence on external expertise. There are, however, some indications of discontent on the part of other sectors of the educational system (often the "formal" primary and secondary schools and full-time universities) over the loss of resources to these "campaigns". There are also traces of environmental incompatibility in the longer-term outcomes of these projects, which appear to have less impact than initially promised.

Type 4: Small scale and local

The final project cluster is, in fact, an aggregate of several different programme types sharing two attributes in common: local origination, with little or no governmental intervention and modest scale. Patterns of project development and outcomes are so various as to limit the usefulness of a prototypical growth gradient. Note, however, that these projects appear to be effective, although the rate of change is very gradual. Our data suggests that this is due to three factors:

(a) resources are lacking for a major thrust;
(b) the interpersonal dynamics of village life make it impossible to move quickly or on a large scale;
(c) the project is potentially subversive to governmental interests, and must therefore be implemented slowly, carefully and sometimes quietly.

At the origin of these projects is a real and generally acknowledged problem: lack of school materials, overpopulation relative to the housing and food supply, loss of youth to urban areas or crime and unemployment of youth within these urban areas. The problem is perceived as sufficiently critical to dislodge inhabitants, notably in rural settings, out of the classic social equilibrium where substantial energy is seldom generated. The problem is typically diagnosed and the solution devised by individuals who correspond to the archetypal image of the innovator: someone relatively younger and more educated than the mean, who has lived for less time in the local setting, and who remains in contact with "cosmopolitan" sources of information, either through personal communication or through the media.

In a project of this type, and when the origins are internal, needs assessments and problem definition are rapidly done. The optimal solution is also easily found, but it is often impracticable or inacceptable; impracticable in that the local setting has almost none of the requisite trained personnel, materials, equipment, facilities or funds. The innovators often seek external assistance in vain, since the project tends either to have too little visibility or too low a priority on a provincial or national agenda. There may also be some difficulty in identifying and contacting these external sources of aid. Our evidence indicates that this is the role of the village leader or provincial official. If the latter is also the innovator, there is likely to be some higher-level financial and administrative assistance which will help the project through its initial and critical phases, but if he is merely a supporter of the innovation and unable or unwilling to get additional aid, implementation is likely to be slower and more arduous. If he opposes the innovation, there is little chance of a successful implementation. In this last case, either a new, more acceptable solution is found or else the project is so reduced in scope that local or provincial officials may not hear about it.

The performance of these small-scale projects as they confront typical barriers, as well as some problems not generally encountered in the three other project types, is briefly reviewed below.

Typically, these projects have high material needs but few possibilities of meeting them. In fact, the possibilities are so reduced that a number of projects fail at this stage. Other projects further limit their scope, while still others try to dramatize the urgency of the problem or the benefits likely to accrue from the innovation in order to recruit volunteers, loans of facilities and materials, etc.

Resistance is typically greater during the initial period of execution than later on, unless the situation is clearly critical. The innovator, aided by a few others, usually initiates a project alone and in the face of a reserved, slightly sceptical public. As local and opinion leaders become actively involved and speak in favour of the project, resistance is lowered. This pattern approximates to the classic S curve of individual adoption.

Lack of requisite knowledge of skills accounts for much of the initial resistance. Here, local innovators are obliged to reduce the amount and intensity of change by spreading demands over time and breaking them down into small, easily mastered steps. This means long periods of

trial in unthreatening conditions, and a great deal of assistance during the initial period of implementation.

The procedural problems encountered in the first three project models are absent here. Both the scale and expectation of behavioural change are small, and the radius of activity is such as to allow quick and efficient communication, coordination, and decision-making. In a sense, L+ is built into the setting. On the other hand, procedural problems unknown, or far less acute, in the other project types exist here. Since these projects operate to a great extent outside the conventional administrative structure, or are not supported actively from above, it takes more time and is more difficult to obtain authorizations, exceptions to approved practices, access to provincial officals, etc.

A final barrier for all types of small-scale or local innovations is the difficulty of generalization. This is not only due to the fact that they are designed for, or grow to fit, specific local situations which by definition cannot be replicated, but also that too small a section of the outlying system has been touched so as to prepare it to accommodate to the innovation. For example, a teacher who has designed his or her own primer and communicated it to others (who use it to advantage) finds that the state examination is based on another official primer. Most projects involving the development of new curriculum materials confront this problem. In these cases, the innovation is limited to a marginal or purely local status until other components around it and administratively or politically above it are unblocked.

Small-scale and local projects are a more hybrid breed than the other three types. They do, however, share some characteristics which permit an examination of their overall adequacy.

O. Paradoxically, these innovations are small but complex for their immediate environment to undertake. Something as simple as a drainage system, the training of unemployed youth, the writing and printing of primers, calls for more skills and resources than the community possesses. These projects are particularly strong in their obvious and unquestioned relevance and in the promised benefits. However, they put too much strain on available resources and most do not succeed during the life of the project in generating external assistance. Some of the projects are judged inappropriate, like the training of village youth in needed but "feminine" professions. In many instances, these projects cause local religious

leaders to react against former expatriates, traditional community leaders being caught in the middle.

R. As resources are chronically inadequate, ambitions are scaled down. In absolute terms, few material resources are called for, but their absence can be crippling, e.g., lack of simple machinery for vocational training, lack of texts for literacy. Requests to provincial officials are either not made, for fear the project will be dismantled or taken over. The bulk of evidence suggests that these experiments "muddle through" with periods of interruption or paralysis interspersed with periods of activity and enthusiasm.

A. Authority is difficult to pin down. Some project initiators appear to be dissidents, producing disapproval and censorship on the part of local officials. Others are themselves community leaders who invest time and energy irregularly. Whenever a sponsor or informal leader leaves the locus of application these projects seem to suspend functioning. In short, problems of adequate or consistent authority seem to be common to this project type.

C. Similarly, consensus tends to vacillate between local enthusiasm and conflict between "traditional" and "modern" groupings at the village or neighbourhood level. That outcomes are generally stable and effective suggests a continuing bedrock of support and assistance throughout.

L. Linkage is high and effective throughout the project, except when there are discontinuities in leadership. For the most part, participants have continuous face-to-face contact and carry out few complex operations. In some cases, however, the infrastructure gets overloaded as officials or trainers try to combine a full-time professional activity with a heavy investment in the training or administration of these small-scale projects.

E. The immediate environment is, for the most part congenial and placid. In many ways, these projects run into trouble precisely because the objectives, trainers or solutions to problems are considered "foreign" to local inhabitants. Thus supportiveness can change fairly rapidly in a highly formalized or inflexible social network. The external environment, on the other hand, is either indifferent or hostile. In particular, provincial officials who feel that educational and vocational activities should be designed, executed and supervised through administrative channels, pose a continuous threat to the project's existence.

V. A theory of innovation generalization

Study of the innovation process over the last several years has brought us closer to a general systems theoretical approach to the phenomena. It seems clear that cultures are composed of more or less tightly bound clusters of elements, people, organizations, institutions, land, resources, buildings, vehicles, etc. The relationships among these elements are clearly ordered and relatively stable, though always changing in some small degree. Some general systems analysts such as Miller (1978) have done a great deal of work in detailing the interconnections and illustrating the generality of patterns across levels (e.g. from single organisms to whole societies). It is only one small step further to realize that a change effort is itself a "system" nearly in the same sense that the receiving culture and its various component subcultures are systems. Thus, a change effort is a kind of collision between systems, a complex inter-system exchange and struggle which may result in any of the following outcomes:

- destruction of either the change system or the receiving system, or both;
- mutual withdrawal without alteration of either;
- fundamental (systemic) change in either or both;
- superficial or temporary change in either or both.

In resorting to systems theory it is hoped to be able to simplify and clarify understanding of innovation processes, and, beyond this, to develop some predictive power, aided by a systemic application of the six ORACLE themes to the inter-system struggle at four stages of evolution. First a brief review of the systems concepts most necessary to this analysis will be made.

A. The general systems conception of the innovation process

1. Defining properties of systems in general

Four basic system properties will suffice: (a) "connection", (b) "cohesion", (c) "configuration" and (d) "production".

(a) connection: if the most rudimentary definition of "system" is merely a set of elements which bear some relation to one another, then connection begins to make explicit what that relation is. Connections can be of many types: one-way and two-way, weak and strong,

communicative, financial, material. A set of connections constitutes a network; stable networks constitute social structures. All other system properties result from or elaborate upon connections.

(b) cohesion: when related and connected elements begin to develop a common identity, when they remain stable over time, develop common attributes and common boundaries, and a sharper awareness that they are each parts of a common enterprise, then it can be said that the system possesses cohesion. Cohesion is the assurance that the whole will not come apart when it is threatened or that elements will not simply be sheared off when they are attacked.

(c) configuration: most systems are not merely random collections of randomly connected elements. Rather there is always a pattern to the connections; some patterns order elements hierarchically, others in terms of sequences, such that activity or disturbance of one element stimulates activity in another and another, but in prescribed sequences. All system activities and reactions can be described in terms of various patterns or routines. Our special interest is in the kinds of routines which systems develop to cope with disturbances, to maintain equilibrium, to grow, and to solve problems.

(d) production: all organic systems are essentially processors of material. They continuously absorb elements from their environment, transform these elements internally, and as a consequence produce new elements, which are either consumed within the system as a maintenance or growth process or are expelled or reinserted in the environment. This production process can neatly be subdivided into the three related processes of "input", "throughput", and "output".

Our theory starts with the idea that people and groups are always aspiring to "develop into something greater or better than they are now. Their pattern of energy output and activity over t[illegible] they are engaged in this development takes the form of periods of rapid growth followed by periods of integration and consolidation.

The theory also proposes that there is a growth sequence for all systems which begins at the lowest level with "relation", i.e. being together in the same space, and proceeds toward "connection", "cohesion", "dynamic connection", and, finally, "dynamic cohesion". When various smaller systems join to form a larger whole, as may happen when new nations are born, this whole process begins anew. The major thrust of the innovation process is to move systems toward higher levels of connection and cohesion.

In order to develop and complete themselves, systems must continually borrow or acquire elements from the environment; this receiving process is called "input". Major inputs may come either from the proximate environment (local) (inside) or from the remote environment (foreign) (outside). Developed systems have elaborate mechanisms for managing inputs from both proximate and remote environments; these include processes for searching, analyzing, evaluating, decomposing, recomposing, adapting, etc. Developed social systems usually have specialists and specialized agencies to help manage inputs. It is also most important to recognize that successful input management requires two-way dialogue with other systems which may be resource providers.

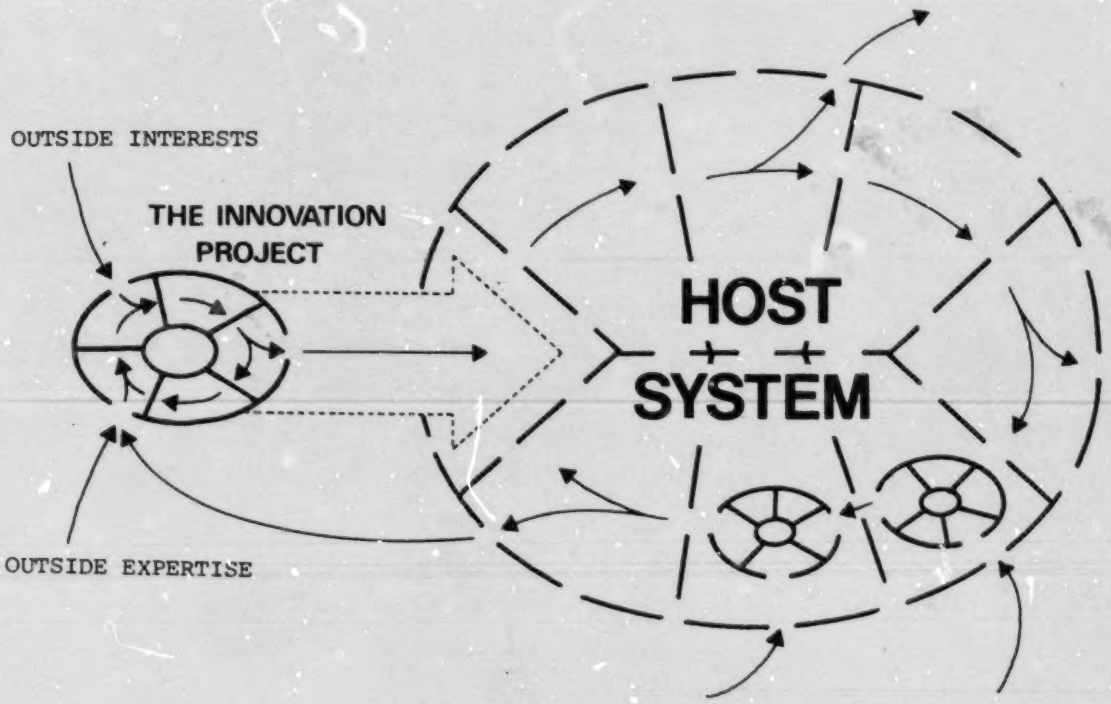
The essential internal process by which the system struggles toward completion can be called the "throughput". Throughput is accomplished by a flow of ideas, knowledge, products and services among the various people and groups who make up the system. The way in which this flow takes place is the key to the difference between more successful and less successful systems. The adequacy of the throughput also depends upon the effectiveness of the system's leadership and the extent to which all members feel they participate and are rewarded by what the system does.

Finally, the effects and the effectiveness of a system are measured by its "outputs". Crucial "proximate" outputs are the rewards that a system provides for its members. "Remote" outputs consitute exports which may either deplete the system or constitute surplus which can be exchanged for vital inputs. Effective output no less than effective input requires two-way communication with other systems.

2. Inter-system dynamics

As the new system becomes implanted in the old, a number of things might happen. At one extreme, the new system uses the old merely as a convenient "host" environment, maintaining its well-ordered, well-connected, and cohesive nature while sucking in resources and producing its preplanned

Figure 4. An innovative subsystem introduced to an underdeveloped host culture



output on schedule. At another extreme the new system may begin to fall apart in a kind of social vacuum and not receive the steady supply of resources it needs to function, while at the same time its various parts are consumed as valuable "resources" for the receiving system, thus not serving the original objectives ("O") of the change agents. Yet a third extreme outcome might be one in which the entering system unites with existing elements, grows, and then multiplies within the host system, and ultimately transforms the host into a new system which is at the same time, better connected within itself, more cohesive, more effectively configured for problem-solving, and more productive in terms of inputs, throughputs, and outputs. Innovation design and planning should aim at the third outcome.(see Figure 4).

3. System passage through time

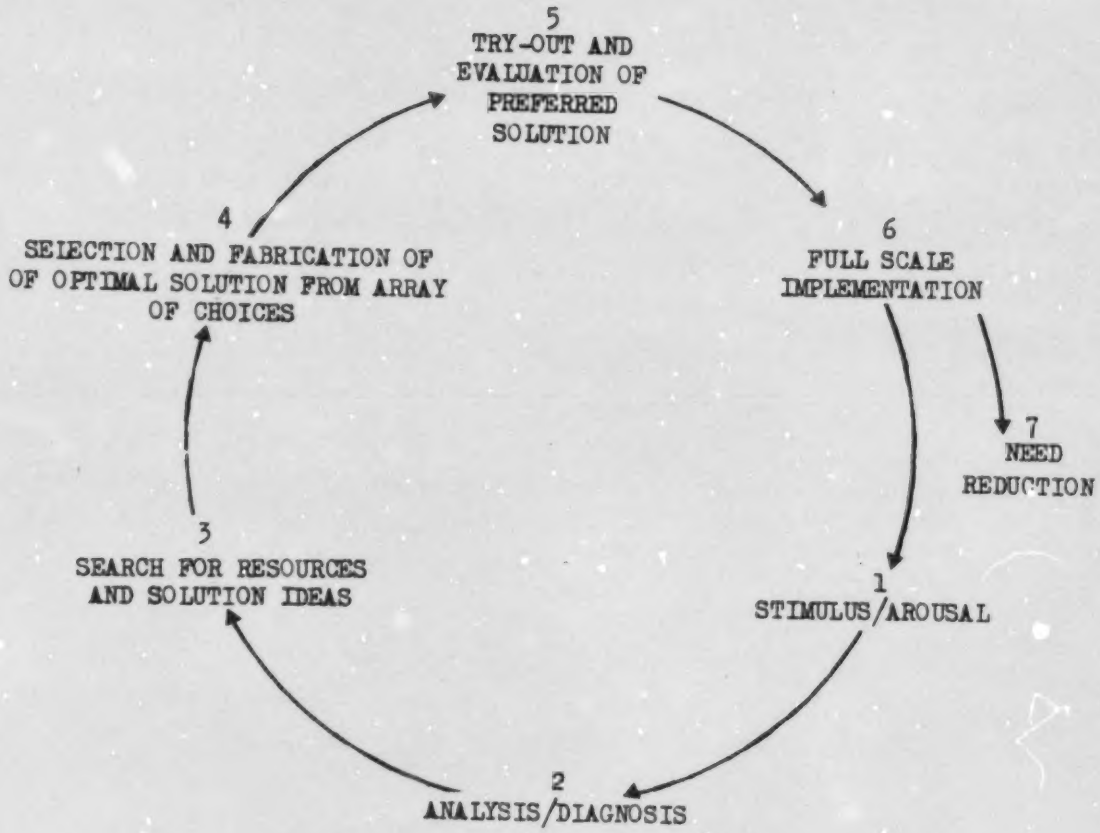
Organic systems do not merely exist; they exist through time, struggling to maintain some form of equilibrium, growing in some ways and declining in others. Within analysis of the time dimension, three rather distinct but related concepts: cycles, steps, and stages, should be traced.

(a) cycles: systems appear to have many up-and-down rhythms which could be called cycles because they appear to begin at a certain point and return eventually to that same point. There is, first of all, the life cycle itself, where the system is "born" out of disparate elements, grows, decays, and finally dissolves again back into disparate elements. Yet within that grand cycle there are many types of shorter cycles. In educational change processes such cycles have enormous significance. At certain times of the school year, for example, new external inputs are almost impossible because of internal preoccupations with (i) starting the school year, (ii) closing down for holidays, (iii) preparing for special examinations, or (iv) preparing for graduations and closing down for the year. Furthermore, one of the most difficult survival tests for an innovation is whether or not it will be taken up again in the school year following the one in which it was introduced.

(b) steps: at a more microscopic and analytic level, almost all human activity is organized "purposively" into ordered sequences (routines), the beginning representing some sort of stimulus to action and the end representing some sort of ultimate or intermediate response to that stimulus. Such sequences may be referred to as "problem-solving", while recognizing that the actor may not always clearly see that there is either a "problem" or a "solution" involved. The simplest problem-solving cycles could involve only two steps: the stimulus or problem step and the response or solution step. At a somewhat higher order of complexity there may be three, four or five steps, incorporating the notions of stimulus analysis (a form of differentiation), search for relevant responses (another form of differentiation), response selection or synthesis (a form of integration), and response testing and adaptation (still other forms of integration).

It is useful to posit an idealized step model of rational problem-solving (Fig. 5) as a kind of yardstick against which actual problem-solving patterns can be measures:

Figure 5. An ideal model of a rational problem-solving process



(c) Stages: at a more macroanalytic level it is important to view system growth (and decline) in terms of stages, distinct periods in which certain kinds of processes are ascendant while others are dormant. A stage hypothesis fits the facts of national development

and educational system development, though probably not as precisely. The implications are clear as regards innovations. Some will be congruent at certain times and not at others. Thus the shaping of innovations and the timing of their introduction into settings must be such that there is a synchronization, a matching of innovation objectives with social objectives relevant to the particular time and stage of development. Since no two societies develop at the same rate or are likely to be exactly at the same stage of development at the same time, planning multinational projects is hazardous. The fact that the innovation project itself as an organic system will go through various stages should not be forgotten. In its early stages it is likely to be full of energy and optimism, open to many inputs, and have the support of dynamic leadership. At a later stage, after it encounters resistance and has to cope with the various realities of implementation, much of the optimum may evaporate, leadership becomes less involved, and energy investment becomes more difficult. A third stage might follow in which the project rebounds, perhaps after the endorsement of some influential person or group. At a fourth stage energy and enthusiasm may ebb again as the innovation becomes more routine and charismatic leaders plan new projects elsewhere. At a fifth stage, if the project survives, there may be a kind of rebirth as a new generation of leadership takes over. One could spell out any number of scenarios and they will be slightly different for any project. Nevertheless, the pattern of stages will show similarities across projects.

The existence of more or less distinct stages of development has a further implication which derives from developmental psychology. At points of transition between stages, a system may be particularly vulnerable or open to inputs of certain kinds. These may be termed as "critical periods" and are always identified

with transitions of some kind: changes of leadership, shifts in values, significant environmental changes, changes from an economic scarcity to economic abundance or vice versa, changes in size of operation, in enrolments, etc. Any of these may be symptoms that one stage is ending and another beginning. The critical period as far as planned interventions are concerned may not be when the transtition is actually taking place; at such times there may be too much turbulence, or people may simply be too busy to attend to new messages. However, just before or more probably just after the transition the optimal opportunity for new inputs and new learnings may occur.

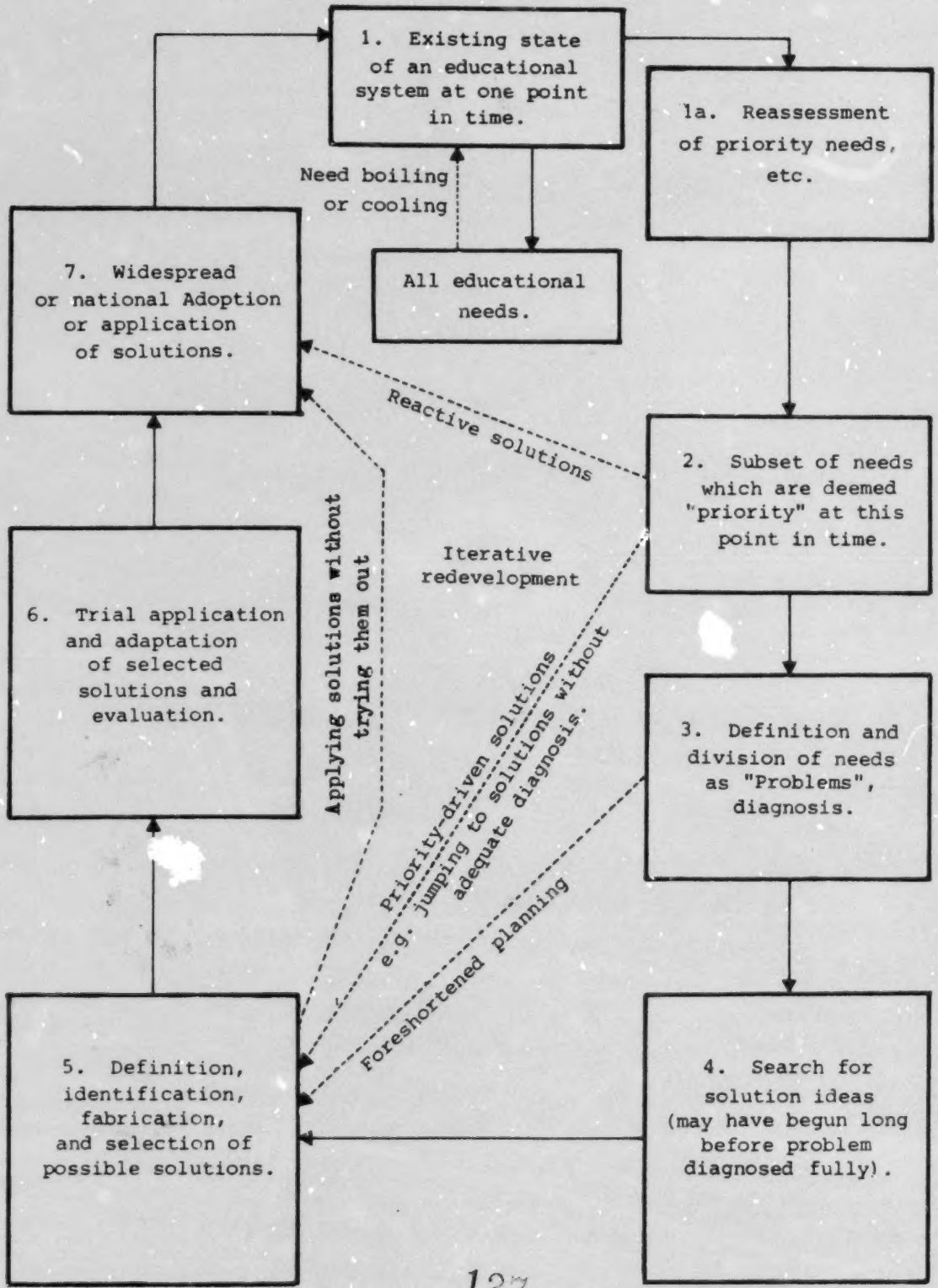
B. The complete problem-solving cycle and the problem of omitting steps

Turning to a consideration of project patterns in reality, the model proposed in Figure 6 may be used to illustrate some common failings both in the planning process and in the execution of innovative projects.

The solid arrows of Fig. 6 suggest a complete cycle of planning and project execution leading both to adoption and to generalization of a reform effort. It begins with some sort of process in which certain needs come to the fore at a given point in time and are deemed worthy of action. However, it is often the case (suggested by the jump from step #2 to #7 in the figure) that the "action" which follows is only crudely reactive such as when individuals are exhorted to "greater effort" or when students are told to perform better. In such reactive problem-solving, little effort is expended in finding out what the problem is; often it is felt to be so "obvious" and/or so "critical" that only action of an immediate and rather simplistic nature is called for. If it happens that the sensed need is the real need and that the reactive solution is the best solution, then there is nothing wrong with such a process; its most outstanding feature is its speed and simplicity. Yet when the true underlying need is more complex such a reactive pattern subverts and negates rational problem-solving effort.

Another common deviation from the rational planning model is what could be called the "solution jump" (from steps #2 to #5 in the figure). In this instance a "solution" or a programme meeting the supposed need might

Figure 6. Long cycle and short cycle patterns of problem-solving


1. Existing state of an educational system at one point in time.
1a. Reassessment of priority needs, etc.
Need boiling or cooling
All educational needs.
7. Widespread or national Adoption or application of solutions.
Reactive solutions
2. Subset of needs which are deemed "priority" at this point in time.
Iterative redevelopment
6. Trial application and adaptation of selected solutions and evaluation.
Applying solutions without trying them out
Priority-driven solutions e.g. jumping to solutions without adequate diagnosis.
3. Definition and division of needs as "Problems", diagnosis.
Foreshortened planning
5. Definition, identification, fabrication, and selection of possible solutions.
4. Search for solution ideas (may have begun long before problem diagnosed fully).

be developed with a considerable degree of elaboration. Nevertheless, there might be an extremely poor fit between this solution and the real underlying need because no effort has been invested in detailed analysis of the need situation. Furthermore, there will be a tendency to adopt a solution which is already available or one which was already being advocated strongly by one or another group; thus, the need does not provoke any sustained search for ideas or sources of expertise which might suggest alternative solutions.

Even where adequate problem analysis takes place, programme planners and decision-makers may be under pressure to find quick solutions and may thus shorten or even eliminate this important "search" phase. (steps#3 to #5) Such foreshortening may eliminate consideration of options which are available from more remote sources but which may offer great advantages over the immediately available one in terms of cost savings, appropriateness, benefits promised, etc.

The figure additionally suggests a fourth type of problem-solving short-cut which is typical of many development projects, namely the move to full-scale adoption without adequate testing of the proposed solution on a limited basis (steps #5 to #7). The full cycle (#5 to 6 or 7) implies a deliberately experimental approach to reform, possibly going through repeated trials over a period of time until near-optimal solutions are developed. In many real-life situations such experimentation may be seen as a luxury and an unnecessary delay. Sometimes the momentum of forward planning will be such that the decision about full implementation must be made before any results from a pilot effort can be assessed. In these cases, the meaning of step #6 is altered and the logic of a "trial" step partially negated; i.e. the function of the trial is not to test whether the innovation will produce the promised benefits but rather to afford an opportunity to provide tools, to train, and to gain some advance experience for the impending and inevitable full-scale implementation.

In reality it is very difficult to keep very close to the steps of a rational process even under the most favourable circumstances. One factor that militates against this is the likelihood that the situation will change even as planning is being undertaken so that the need which existed originally will be rather different to when the innovation is being selected or when it is being implemented. Thus a truly rational planning process is one which assumes and allows for recycling from any stage back to any other prior stage, to reassess needs, to make a different kind of solution search, and so forth.

ORACLE in relation to the problem-solving steps model

Each of the six themes discussed above relates in a special way to each of the problem-solving steps. For example, "O" goes through a complete metamorphosis from Step #2 (where it may be a vaguely perceived and rather generalized objective to do something about a particular need) to Step #5 where it is fully specified as a desired course of action (though still perhaps in abstract form), to Step #6 where it becomes an operational reality on at least a limited basis to Step #7 where it becomes an incorporated aspect of a changed or reformed system.

Necessary and relevant resources ("R") also change at different steps in the process. Ideational and knowledge resources are most critical at Steps #4 and 5; an orchestrated mix of material, financial and human resources becomes critical at Step #6, and at Step #7 all types of resource requirements increase rapidly.

The need for approval and sanctions from legitimate authority ("A") are probably most critical in Step #2 (need priority), in Step #5 (choosing a particular solution), and Step #7 (moving to widescale adoption) but authorization or lack of it can play a critical role at any other stage also. Consensus ("C") is also desirable at any stage, thus suggesting the need for various forms of participation in the planning process but it is certainly most critical at Step #7 and beyond during the longer term maintenance and routinization of the reform.

Linkage ("L") may also have somewhat different meanings at different steps. In the early stages it is probably most crucial for the planners and other agents of the reform to be well linked to the existing power structure as well as to persons who can provide the clearest perspective on the educational needs of the culture. Thus any change team needs to be composed of a proper balance of insiders, outsiders and persons representing different interest groups and different levels of the system. Linkage within such a complex team would also be a matter of major concern. At Step #4 the concern would be for adequate linkage to the range of sources inside and outside the culture which can make potential contributions to the solution. In general at this stage, a change team most clearly needs connections to relatively remote and diverse sources of expertise. At stages #5 and #6 the critical linkage issues are probably as much to do with processes as persons, i.e. the need to develop an innovation and an implementation strategy which is reasonably complete and logical and interconnected in a holistic sense.

At Step #7 the required linkage again becomes structural and interpersonal as much as it is process: there must be an adequate infrastructure of roles, organizations, training mechanisms, and procedures established throughout the system to make widespread acceptance and use possible and meaningful in terms of the original objective.

Finally, certain environmental issues pervade the process from beginning to end. Most crucial will be the relative level of stability vs. turbulence in the adopting culture. Turbulence militates against planning and even more against complex, longer and more rational planning cycles. It should also be noted that some environmental factors may change quite radically in the midst of a development cycle, necessitating either recycling or abandonment, or perhaps merely postponement (as in the case of the delay in generalization of the Comilla experiement during the revolutionary period when Pakistan became Bangladesh). Occasionally, the reform process itself will change the environment, particularly when it is actively promoted by powerful groups or persons in the early stages.

C. A stage model of innovation generalization

In the previous section it is suggested that the reform process could be seen as a cyclical process involving various "steps" or problem-solving which follow one another in a logical and temporal sequence. It has also been implied that various transformations occur from one step to the next. It is now intended to focus merely on two notions which were imbedded in that discussion; one was the notion of transfer or transition and the other was the passage of time. In Figure 7 this matter is put most simply).

Figure 7. Time-transfer as a perspective on innovation generalization

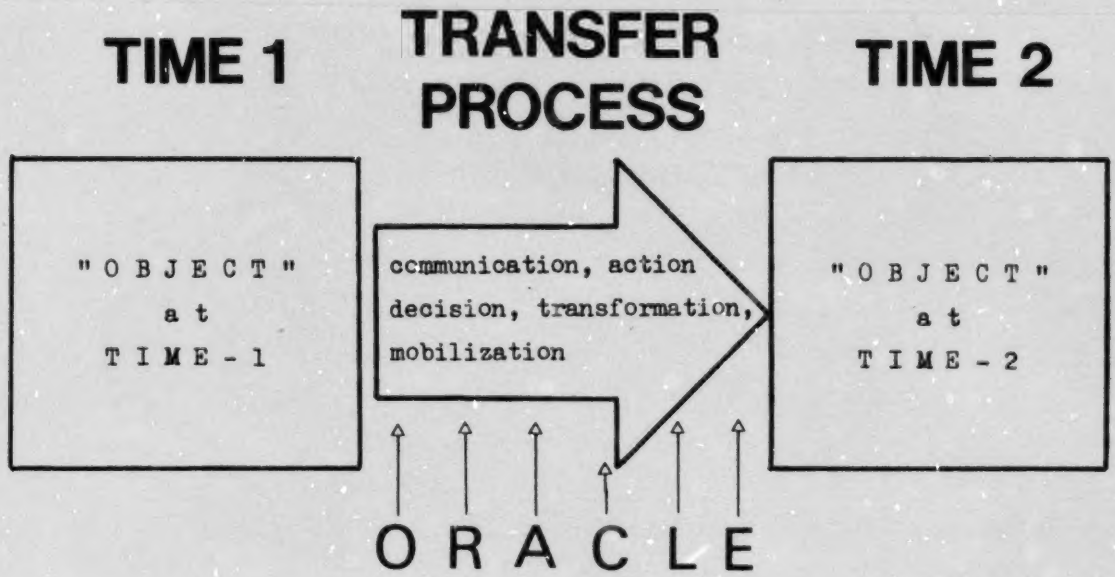
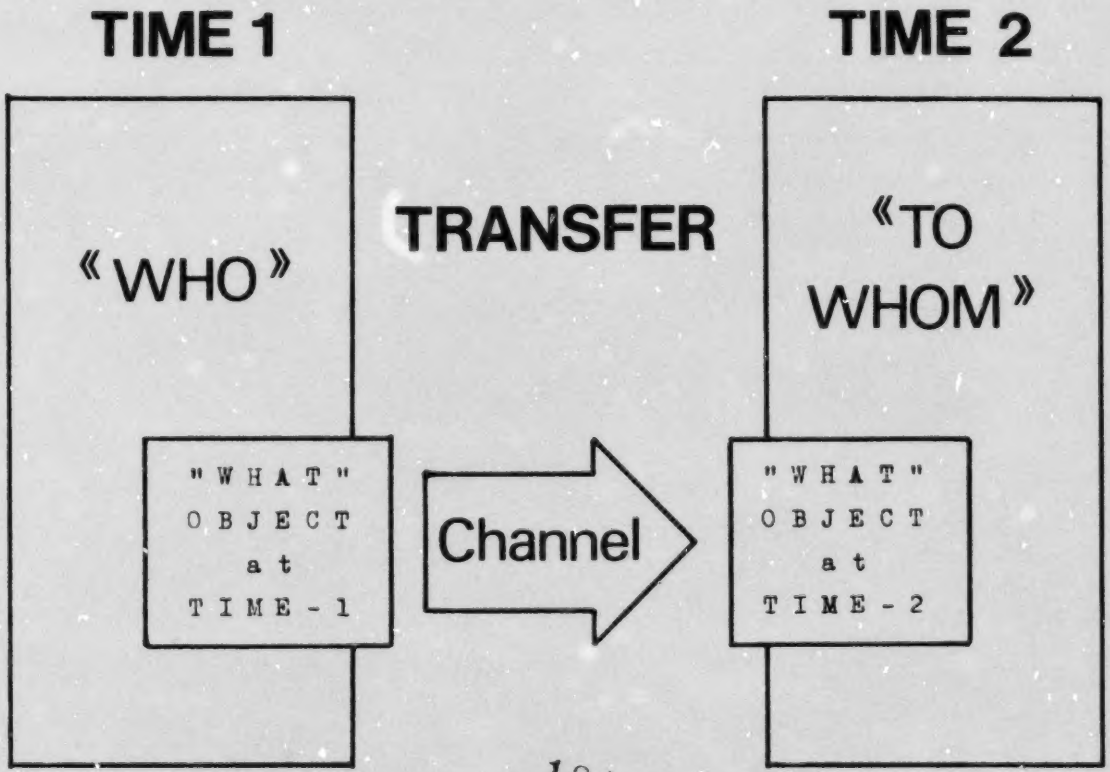


Figure 8. The communication process as a time-transfer phenomenon



In Figure 6 each connection between "steps" can also be viewed as a time-transfer phenomenon. The six "ORACLE" themes are present and interact at each time-transfer connection.

The time-transfer concept can also be used as a way of analyzing elementary communication processes between people and groups. The traditional formula for communication from one unit to another goes as follows: "who says what to whom on what channel to what effect?"

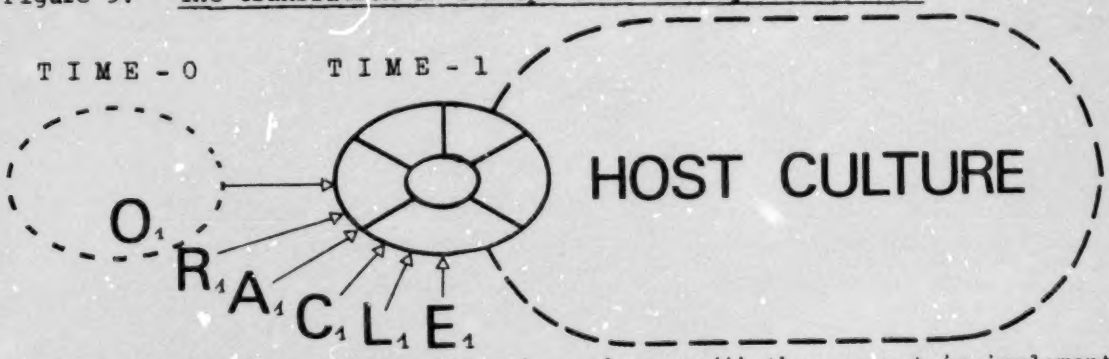
Figure 8 merely translates the communication formula into time-transfer terms, and thus illustrates an important point, namely, that in the very process of communication the message of the sender ("object") may be transformed so that what is experienced at time-2 and in the world of the receiver may be quite different than either what the sender intended as the object or even what was actually sent.

Returning now to the question of innovation generalization, these threads can be pulled together into one fabric. Innovation generalization is both a problem of communication and a problem of transformation. It can be perceived as a sequence of stages which begins with the transformation of a concept of "objective" into a programmatic reality, perhaps initially on a small scale and for a limited period of time. Assuming success for this first stage of "initial implementation", there are two types of problems that might arise at the next point in time: one of these could be described as the "continuation" problem, that is, the problem of how to maintain the innovation at somewhere near an adequate level of performance through succeeding time periods at the same site. The second problem, not necessarily similar to the first is the "diffusion" problem, that is, how to get something like equivalent adoption and implementation of the desired reform in many more sites or in the society as a whole. Yet a third stage of

generalization involves the continuation and integration of the diffused innovation into the larger culture, and, perhaps, thereby the transformation and development of that culture into a system which functions at a higher level than before.

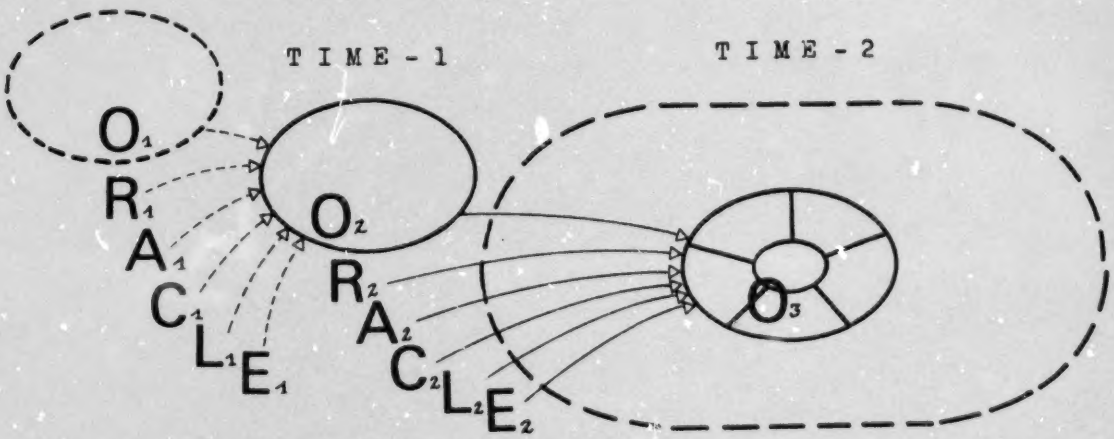
Each of these stages can be illustrated by a diagram which suggests both the time-transfer phenomenon and the inter-system connecting and integrating phenomenon. Figure 9 illustrates the "pilot" stage, the initial translation of a concept of a reform into reality at some site. In the figure the host culture is drawn as a somewhat loosely connected and loosely defined system whereas the pilot project is relatively clearly articulated as an integrated and well connected subsystem existing on the fringe of the larger host. This, of course, is only one scenario.

Figure 9. The translation of concept into reality in one site



Various alternatives include situations where: (i) the concept is implemented from the beginning throughout the culture, (ii) the host culture is, in fact, more integrated than the innovative subsystem, and (iii) the innovative subsystem does not enter at the margins of the host culture but at the very centre. Figure 9 shows that a successful implementation of the reform on whatever scale requires the orchestration of the six ORACLE themes.

Figure 10. The first generalization stage: Continuation



In Figure 10 we have simply moved one step further in time in the same site. Here the time-transfer concerns a transformation of the reform into a more stable and enduring phenomenon. It is also suggested in the figure that part of this process involves moving into a more central, connected, and functionally integrated position within the system of the host culture. What is most important to realize at this stage, however, is that the ORACLE themes play their roles in new ways at this stage; thus, successful transition to a more established existence for the reform effort requires careful planning and management of issues related to each. For example, successful continuation probably requires some adaptation of the reform itself (O); it requires a new or renewed marshalling of resources (R), perhaps resources of a different kind and most certainly financial resources which are more clearly indigenous to the host culture; it requires a firm commitment on the part of leadership (A), perhaps now sanctioned in terms of new rules or changes in established procedures either to allow the continued existence of the reform or to specifically sanction it; most important at this stage will be the active support (rather than the mere acquiessence) of the various interest groups affected by the reform (C) at least within the site; it will further require the establishment and the strengthening of many linkages (L) to authority figures and to various functionaries within the host culture who will have continuing responsibility or will be contributing special skills to the effort on a routine basis. Finally, at this time for many projects environmental turbulence in the host culture may take a terrible toll as key staff are attracted to other causes, and as more basic survival priorities of individuals lead to resources intended for the reform being used elsewhere.

Figure 11 depicts another time-transfer phenomenon in which the original implanted innovation multiplies within the host culture. In fact, this stage may take place simultaneously with the continuation stage or may even take place without it. On the other hand, it may never take place at all, as in the type of projects described earlier as "small scale, local". Once again, the success of the diffusion process will depend heavily on the same six themes, this time within a larger societal context. The first issue to be considered is whether the reform concept (O) is intrinsically suitable for widespread adoption across the culture or at least at a number of other sites. Even if potentially suitable, one must consider the inherent communicability of the concept, its resource demand characteristics, and its compatibility with norms, values, and established practices of the host culture as a whole. It is also likely that special resources will have to be brought together (R) to transform and package the innovation for transfer and to provide the necessary start-up support in financing and expertise at each of the new adopting sites. Obviously this raises the possibility of great escalation of reform costs and, furthermore costs which will have to be born locally to a much greater degree than in the orignal "showcase" stage. At the same time there will have to be rather clear and widely publicized commitment to the project from authority figures (A) and a degree of consensus among a far larger, more complex, and more diverse set of publics than was the case at either previous stage (C). Linkages (L) will also have to be far more extended. Here, considerable knowledge exists from sociological studies of the diffusion of innovations (see Rogers and Shoemaker, 1971, for the most authoritative summary of these studies) which points to the importance of linkages, patterns of leadership and social integration as necessary prerequisites for diffusion. These are the very same patterns which may be very poorly developed in the third world. Finally, effective diffusion will depend on the host culture providing an environment which is on the one hand stable, and on the other hand reasonably open to change (E).

Figure 12 shows a third generalization level in which the implanted and diffused innovation becomes thoroughly integrated and routine throughout the host culture, such that it becomes a part of a transformed and, hopefully, more developed social system. This, too, is a stage which may never happen, or it may happen in such a way that the original concept (O_1) survives in name only while the finally implemented reform (O_5) is indistinguishable from educational practices in force at time-zero. At the other

Figure 11. The second generalization stage: extension and diffusion

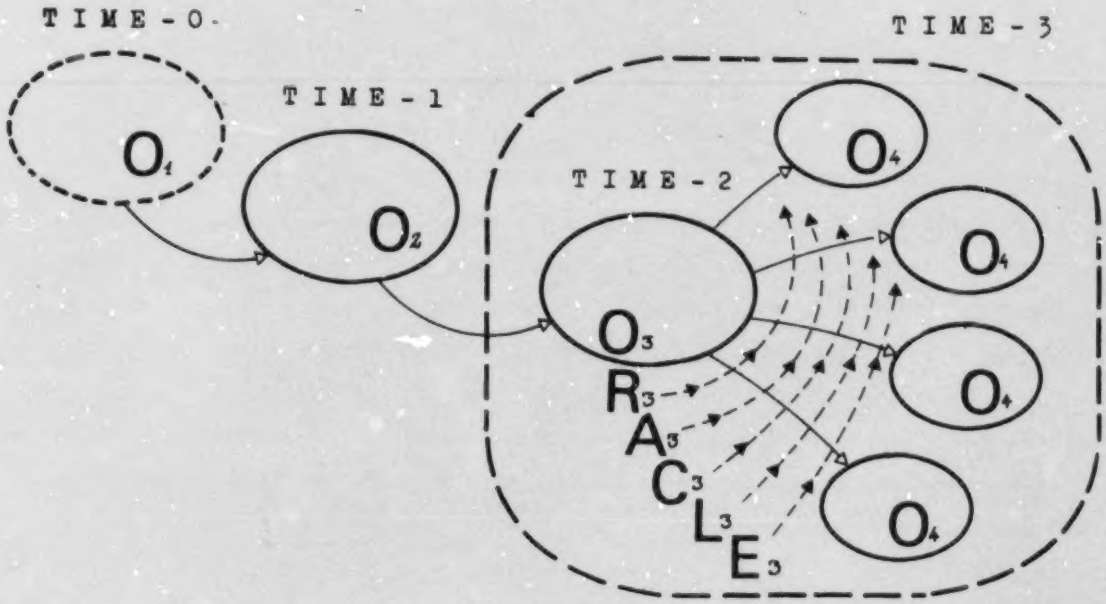
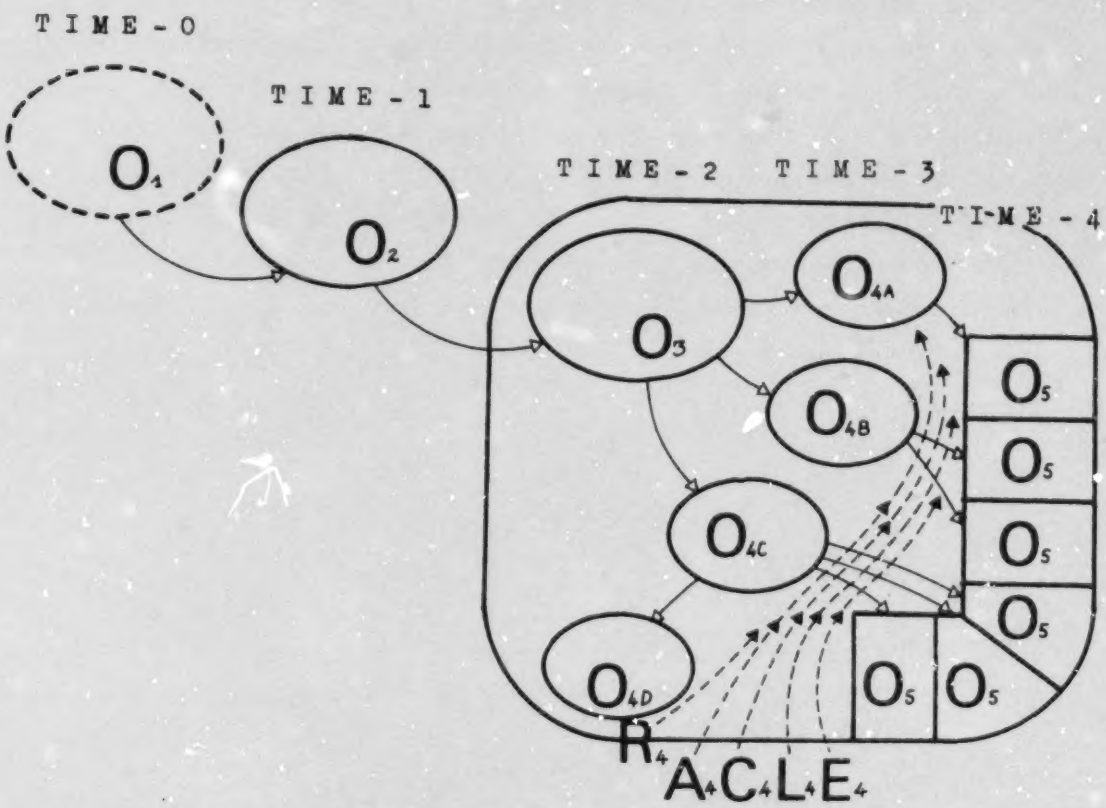


Figure 12. The third generalization stage: system-wide integration and routinization



extreme, a reform concept and its implementation may be so powerful (as perhaps in the adoption of an entirely new ideology after a revolutionary change) as to completely transform and, in effect, take over the host culture. The great difficulty of providing a planning function for system-wide routinization at a time so distant from the original promotion of the concept should be noted. Once again each of the six themes deserves special management in this context. Actually, planning considerations here are not different in kind from those discussed for the first generalization stage, continuation, although there is a shift in order of magnitude as planning must be undertaken for the entire host culture.

Even beyond this third stage of generalization, there might be additional stages in which, for example, a capacity is developed within the host culture for continuing reform and for continued re-evaluation of past reforms.

V. Conclusion: Where do we go from here?

In this paper an attempt has been made to elaborate a theory of innovation generalization. It starts with the premise that reform is an inter-system phenomenon which can be broken down into a series of time-transfer segments. Each segment in turn can be analyzed and understood in terms of the interactive effects of six themes: object, resources, authority, consensus, linkage, and environment. Time-transfer segments can be viewed in at least two ways; first, as a configuration of steps in a cyclic problem-solving process and, second, at a more macroscopic and time-extended level, as a series of stages which move the reform effort from abstract concept to successively more extensive and integrated levels of realization in a host culture.

The theory is so far somewhat loosely grounded in prior analysis of the case study literature on innovation in developing countries as well as in extensive interviews and questionnaire responses from a large number of Unesco consultants and project leaders. The ORACLE formula is admittedly a contrivance but it is also a rather concise summarization and codification of a mass of empirical findings. Thus it is hoped that it can become a useful tool for researchers on the one hand, and practitioners, consultants, planners, and project managers on the other. Before this can happen it will undoubtedly need some additional refinement and translation into operational terms; each "theme" in fact comprises a rather complex cluster of variables, each of which requires some attention in a careful project planning effort.

After such refinement the model needs to be applied with some rigour to a number of recent projects for which ample documentation as well as live testimony are available.

As further analysis is made, the innovation process is shown to be more and more complex. It is indeed a wonder that projects do sometimes succeed despite the near impossibility of thorough planning of each step along the way. It is also a fact that the decision-maker and the person with operational responsibility are often under great pressure to act quickly and perhaps on a large scale, to apply simple "solutions", to use grossly inadequate resources and grossly overblown rhetoric. For such persons there is little time or opportunity to think systematically, to plan a rational sequence of problem-solving steps, or to put their "ORACLE" in order. To help such people, it is necessary to continue to seek formulas of simplification which encapsulate our understanding without doing violence to either logic or to the documented realities observed.

NATIONAL EXPERIENCES

THE GHANA EXPERIMENT IN CONTINUATION SCHOOLS

by N.C. Anim,
Director General,
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Background to education in Ghana

On 6 March, 1957, the former British Colony of the Gold-Coast became the first of Britain's overseas possessions in Africa to emerge as an independent and sovereign state. New nations which have been thus capituiated into sudden statehood, have had to face many new and equally urgent problems in the periods following independence, and prominent among these has been that of personnel development.

The solution to meeting manpower needs has been similar among the newly independent nations: planning and the opening up of greater educational facilities and training programmes. It would seem essential for educators to match changes in political status by changes in educational policies and structures.

The fact is that the educational structure as such is only belatedly touched by the fervour for change that regularly accompanies changes in political structure. Thus educational policies can hardly be said to have kept pace with rapid changes in political events in a newly developing country. In his report on the Education Act of 1961, the Minister of Education in Ghana stated the following:

> "At the time Ghana became a Republic, on 1st July 1960, new education legislation had been under consideration for some years, but changes and developments in the country's school system had been so rapid that draft bills were always overtaken by events. Thus the Education (Southern Gold Coast and Ashanti) Ordinance, 1925, and Education (Northern and Upper Regions) Ordinance, 1927 were still in force and the whole country had no single law for education."(1)

(1) Ministry of Education. Education Report 1960-62. Ministry of Information and Broadcasting. Accra 1963, p.9.

Leaders of the new nations of Africa in general and Ghana in particular consider education as a powerful and functional instrument that is of critical importance in determining the nation's level of well-being. Accepting this functional view of education, the Commission appointed by the Nigerian Government to study "Post School Certificate and Higher Education needs of the country, appropriately entitled their report: "Investment in Education". This report makes the following statement about the need to link manpower development to the educational needs of the country:

> "It would be a short-sighted policy to allow the educational system of a country to be controlled solely by "consumer needs" for manpower. However, it is part of the duty of an educational system to meet these needs, and in a young country particularly they must be given prominence."(1)

This same idea is expressed in the last Seven-Year Development Plan of the 1st Republic of Ghana (1963/64 to 1969/70). It is significant that education and manpower development are both grouped under the same chapter heading, and the subject of education is introduced thus:

> "We must look to industry and agriculture to provide an increased standard of living, but these two sectors of the economy are dependent on an adequate supply of suitably educated and trained manpower. In a sense, education takes precedence over the other two as the mainspring of economic progress ..."(2)

This functional view of education which has dominated policy-making and educational thinking since the early sixties was given a big boost and direction by the Unesco sponsored conference on the Development of Higher Education in Africa which recommended among other things that:

> "The proportion of all African students enrolled in scientific and technological subjects including medicine and agriculture should reach not less than 60% by 1980."(3)

Since the above conference, development linked with the study of science has been more imaginary than real.

The third and last point to be made in this introduction is that there is a state of urgency stemming from the pace of development in Africa

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(1) Ashby, Sir Eric; Investment in Education, Lagos Federal Ministry of Education, 1960, p.7.
(2) Ghana National Planning Commission; Seven-Year Plan for National Reconstruction and Development. Financial Years 1963/64-1969/70. Office of the Planning Commission. Accra, 1964, p. 141.
(3) Unesco; The Development of Higher Education in Africa, Paris, Unesco, 1963, p. 71.

in general and in Ghana in particular. Even the leaders of the new states of Africa cannot help but be bewildered by the pace of events. Dr. Nkrumah, first President of Ghana put it thus:

> "The gains that the freedom fight in Africa has made in a few years are astounding. No one would ever have believed that country after country could so rapidly have gained their independence. Not long ago - not yet ten years away - certain African leaders were still shy of even using the word "independence"."(1)

The problems that the rapid turn of events present are staggering. The Standford Research Institute indicated in their studies in the sixties that Africa has the highest illiteracy rate of any of the continents - 80-85%. It was estimated that at least 65% of the total population of Africa was of school-going age, and only 11% was at school. In spite of this great educational handicap, the tempo of development has not eased up. It is indeed within this tempo of development that educational development in Africa today must be seen.

Rationale for the continuation school programme

Given the three points raised above: change, functional education and the feeling of urgency to educate, one can easily understand the rationale behind the programme for Continuation Schools in Ghana. The school system as it operates today bears a close affinity to the pattern set up in colonial times by British administrators. A child goes through six years of primary and four years of middle school education, making up a total elementary school programme of ten years. Subjects taught generally include reading, writing, arithmetic, English language, bible knowledge, history, geography, art and crafts, general studies and vernacular. General science was only added after the mid-sixties following closely on the advice of the two Unesco Conferences of Education held in Addis Ababa and Tananarive respectively. Thus over the years, an academic, liberal arts pattern was set which has persisted till today.

In 1967, an Education Review Committee set up by the Government reported on education in the country generally. This report reflected the concern that was felt in the country about the difficulties that the middle school-leaver faced when he dropped out of school. The situation was

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(1) Nkrumah, Dr. Kwame; Step to Freedom, Accra, Ministry of Information & Broadcasting, 1962, p. 18.

described in the Education Review Committee's report as follows:

> "Already 50,000 children leave Middle School every year, nearly 80% of them with the Middle School Leaving Certificate. In five years the number of leavers will be nearly 100,000. These leavers are presenting a very serious employment problem. The education they have received is not oriented towards productive employment. There is a tradition that anyone who has been to school should be given a "white collar" job and consequently these young people drift to the towns in search of the kind of work they think they are suited for, and create social as well as employment problems. There is no longer much demand for this level of manpower and it is said the pupils are being educated for frustration."

This aptly reflects the thinking and the realities of the time. Of the almost 60,000 young people who left middle schools in 1969, it is estimated that nearly 40,000 failed to obtain paid employment. Popular feeling expressed through the mass media, throughout the churches and various organisations indicated that what was really needed from education is a system of schooling which will provide the pupils at each terminal stage with some occupational competence relevant to the current needs of the country. The "current needs" may be appropriately associated with rural development, knowledge, skills and attitudes.

Rural activities and agriculture stand out as the foundation of the Ghanaian economy, underpinning the expansion of all sectors. Rural activities affect the majority of the economically active population and will continue to do so for the foreseeable future. According to the First Annual Report of the Ghana Manpower Board, 1968, 2 million people out of the county's labour force of 3½ million are directly engaged in agriculture alone.

What goes on in the schools must therefore be relevant to the life and work of the community. Rural schools must make rural life the centre of the curriculum - a curriculum based on the existing and potential occupations of the people. This means that courses must be introduced related to productive occupations such as farming and fishing; to crafts such as retailing and any others concerned with services required by the community.

These were the concerns and the rationale behind the decision to set up pre-vocational courses aimed at orienting pupils, not destined for secondary schools, towards productive occupations. The entry point for this type of education was the middle school level. At primary VI grade, pupils take a "Common Entrance" examination for entry into a second cycle institution.

This is the point where the numbers dropping out are highest. An average of 120,000 pupils take this examination but available places amount to only 18 - 20,000. The programme of "Continuation Schools" is aimed at the remaining 100,000 who would otherwise swell the ranks of the unemployed each year.

Administrative arrangements

Having identified the intital needs for a new orientation in our education to meet a near crisis situation, a Committee was set up to plan a line of action. The following three issues were identified for the formulation of objectives:

(a) There was a need to plan for the eventual solution of the unemployment problem.

(b) There was a need to plan to effect changes in the attitudes of school-leavers to direct them away from white collar jobs to more profitable, practical, vocational occupations, and

(c) There was a need to train children to acquire the necessary skills that will aid development in rural areas.

Aims and Specific Objectives

(a) The General Aim

This derives from the issues identified above. The offerings of the Continuation School should involve such subjects as will pre-dispose pupils to vocations and either direct them to gainful occupations in the modern sector of the economy or enable them to start individual businesses of their own. The types of occupation should be related to their rural districts and the training must be such that it should trigger attitudinal changes that will create an appreciation of rural life.

(b) Specific objectives

(i) Courses are to be patterned on the farming and and industrial needs of the country.

(ii) Courses are to help pupils who are finishing their formal education to make the important

decision to settle in productive occupational activities in rural areas.

(iii) The particular bias of any school operating "Continuation" classes should be related to the kinds of occupations for which there is scope in the district surrounding the school.

Pilot project

On the recommendation of the Committee, a pilot programme of "Continuation Schools" was set up in the 1969/70 academic year. Initially this involved two schools from each of the 9 regions of Ghana, making a total of 18 such schools for Ghana. Within four years the number had increased to 700 and today (1980) stands at over 1,200.

It is also pertinent to note that the initial plan which limited continuation courses to only the 9th and 10th grades had to be modified considerably as a result of the feedback received by the Education Service. Courses are now offered in all four classes and the programme has now become part and parcel of middle school courses.

Administrative staff

Initially only one officer was appointed to take charge of all the administrative aspects of the new project. This officer was based at the headquarters of the Ghana Education Service. It was envisaged that in due course Regional and District Supervisors and Co-ordinators would be appointed. With the rapid expansion of the programme occasioned by direct requests from head teachers of middle schools and from chiefs and parents, we now have 9 Regional and 60 District Organisers - in addition to the National Organiser.

Apart from these National, Regional and District Organisers, each head teacher in a cooperating middle school acts as a local supervisor. He was initially in charge of the two teachers posted to his school to teach agriculture and craft courses. Now the general pattern is that the head teacher has as many people teaching continuation courses as he has teaching the regular academic courses.

Evaluation

There has been on-going assessment and evaluation by the Regional and District Supervisors who report back to the headquarters of the Education

Service. Decisions to expand the project are left to the Director in charge of Basic Education who acts in consultation with the Director-General of Education.

After five years of operation, a full formative evaluation was made and the report submitted to a Committee which recommended the long term merging of this programme into the "Junior Secondary School" programme.

Administrative problems

(a) Size of the Pilot Project

The first problem encountered was, curiously enough, an under-estimation of the demand for this type of vocationally oriented education. Pressure from local communities and local chiefs forced us to commit ourselves, at the pilot project phase, to a wider coverage than was advisable. It has been mentioned above that originally 18 schools were to be involved in the pilot project. Before the first five years could elapse (after which the pilot project was to have been properly evaluated), the number of schools involved already exceeded 700. This brought other major problems.

(b) Equipment

A programme of education to import a skill and having a practical bias demands a considerable input of equipment. Tools needed are not the sophisticated type; emphasis is on local craftsmen and the tools they normally use. Even so, it became obvious that the type of equipment needed for the pilot project and for the Continuation Schools generally was more than one expected and used in the normal middle school. Even though budgetary provision was made to cover equipment for the pilot project, it soon became also obvious that, with the strict control of foreign exchange in force in the country, this project was not going to receive priority treatment in the allocation of Import Licences. Without adequate basic equipment, however, both the pilot project and the generalized programme on the whole would flounder.

A temporary solution to this problem was to obtain aid from external sources. UNICEF has, since 1970, been supplying equipment for the following subjects:

Agriculture (including poultry)
Woodwork
Metalwork
Masonry
Plumbing
Vulcanising
Welding
Electrical repairs
Tailoring, and
Pottery

UNICEF has in addition supplied 21 vehicles for supervision and distribution of equipment.

The Australian Government has donated woodwork, metalwork and masonry equipment for six Continuation Schools.

In order to provide a solution to this problem, in the long term, each region normally budgets for the equipment required. This budget is then sent to the headquarters of the Education Service which collates all budgetary requirements and submits them to the Ministry of Finance for the necessary appropriation. In addition to budgetary appropriations, school pupils who attend workshops pay between ¢1.00 and ¢2.00 towards the purchase of raw materials. An attempt is also made to use the grants given to schools by the Government to purchase equipment and materials in bulk for distribution to schools.

Perhaps the most promising source of funds is from 18 "Production Centres" which have been selected to produce basic garden tools, woodwork tools and toys for our Day Care Centres on a large scale. Products from these centres are sold in bulk to the other Continuation Schools. It is hoped that these production centres will be expanded to produce adequate basic equipment for all Continuation Schools.

(c) Teaching Staff

With the new type of orientation and objectives set for the Continuation Schools programme, there is need for a new type of teacher appropriate for the project. The Ghana Education Service trains teachers in a variety of schools and colleges for the Continuation Schools. Instructors, local craftsmen and resource personnel from other Ministries are also employed to teach courses like finishing, dress-making, tailoring and hairdressing. There is an acute shortage of teachers at all levels and in all the subject areas covered by the Continuation School programme. In-service training and workshops organized throughout the year and during vacation times have been resorted to in order to upgrade serving teachers as well as help to re-orient new teachers in the field.

Achievements of the continuation school project

The Continuation School Programme has reached a point of general acceptance and has formed the basis for the structure and content of the new education system in Ghana. This new programme aims at giving education a new orientation to make it sensitive and relevant to the needs of the country. The objective is to use education to serve the needs of the individual, the society in which he lives and the country as a whole. Every child, therefore, is to be given the opportunity to develop his talents to the full to enable him to become a full citizen, earn a living and improve the quality of his life. These are the basic concepts which led to the introduction of the Continuation School as an innovation during the 1969/70 academic year.

Obviously the success of this innovation is to be measured in part by the degree of acceptance of the programme by the pupil; this in turn will depend on the ease with which the pupil on dropping out, will fit into his environment. For this purpose a follow-up survey was carried out.

One region in Ghana - the Central Region - was selected for the follow-up study because it offered easy access. This region has a little over 150 Continuation Schools and of this number, approximately 105 are functioning well. Out of the thirty courses being offered in these schools, nine were selected at random for study; these were:

(a) Fishing
(b) Metalwork and Blacksmithery
(c) Poultry Farming
(d) Piggery
(e) Shoemaking
(f) Fitting and Welding
(g) Dressmaking
(h) Hairdressing
(i) Crop Farming.

Schools selected consisted of 18 Continuation Schools and 10 schools which offer the general middle school courses to form the experimental and control samples. Pupils in the experimental sample had attended the full Continuation School course while those in the control sample had attended the general middle school course. The total number of pupils involved was 561 made up of 299 subjects in the Continuation School and 262 in the general middle school. For purposes of convenience, the Continuation School subjects will be referred to as Group A and those from the general middle as Group B.

Results of study(1)

Head teachers of all the selected schools were contacted by letter requesting them to help interviewers obtain the addresses of people who had passed through their schools within the past six years. A total number of 900 interview schedules were sent to the Continuation Schools. Out of this number only 299 were completed, indicating a return of 33.22 per cent.

For the general middle schools a total number of 400 interview schedules were sent out. Of this number 262 were completed, indicating a return of 65.5 per cent. A significant reason for the large difference in the returns is that most of the people who attended Continuation Schools were working as tradesmen or as apprentices, or else were undergoing further training outside the districts where the investigation was being conducted. On the other hand, a great number of people who had attended the general middle school have difficulty in securing employment or further training and were mostly therefore still living in the areas where they went to school. Table 1 shows the opportunities for employment or further education found by students who went through the two types of education.

(1) Quansah and Amin, The Continuation System, Accra, unpublished manuscript, 1978, p. 24.

Table 1. Employment and training opportunities found by school-leavers

Subjects	Self-Employed 1	Employed by Institution 2	Apprentice 3	Student 4	Unemployed 5	Total 6
Continuation School	16.72	26.42	18.39	13.04	25.42	100.00=299
General Middle School	11.45	18.70	13.74	7.25	48.85	100.00=262

Column 1 indicates that of the 299 Continuation School-leavers who were interviewed, 16.72 per cent had started out in their own businesses based upon the training they had received in Continuation Schools. The 11.45% of the general middle school-leavers who were self-employed were mainly females who were engaged in jobs like dressmaking and petty trading. The boys in this group were mostly engaged on crop farming. It should be noted that these people had not studied anything in connection with their present occupations. Column 2 shows that 26.42 per cent from Group A as against 18.70 from Group B were employed by firms and institutions. While the former were mostly employed in jobs related to what they had studied in school, the latter were mainly employed as farm hands, labourers, hospital attendants, market revenue collectors and in other unskilled jobs. Column 3 shows that 18.39 per cent of Group A were engaged as apprentices in trades, the rudiments of which they had acquired in their school programme, while 13.74 per cent from Group B were apprenticed to trades on which they had had no previous instruction. Data presented in Table 2 show that in general 74.58 per cent of people who had had continuation school education were either self-employed, employed by firms, or apprenticed to a trade in which they had had previous instruction in school. The equivalent percentage of 51.15 of people from Group B, although employed were employed on unskilled jobs or else apprenticed in trades of which they had had no previous instruction in school. The rate of unemployed is far higher among Group B. Of the 76 people in Group A who were unemployed, 67 or 88 per cent of them had been trained in crop farming. In other words, a sizeable proportion of those unemployed in Group A had not had some previous vocational training which could eventually be turned to profit.

To the question whether education in school had been of any benefit to the interviewees, 65.22 per cent of Group A and 49.24 per cent of Group B replied in the affirmative.

Table 2. Summary of job opportunities for the two comparative groups (in percentages)

Type of School	Employed Apprencticed, etc.	Unemployed	Total
Continuation School	74.58	25.42	100.00=299
General Middle School	51.15	48.85	100.00=262

Thus respondents from the general middle school education group were almost equally divided on the question of whether their previous schooling had been of any benefit to them in their jobs. The raw data shows that 129 of this group responded "yes" and 133 responded "no". Such a near equlaity in the frequency of responses tends to indicate that the frequencies for yes and no for this group of people occurred by chance, i.e. that whether education was beneficial or not was neither here nor there. The response to the question of whether the training or education respondents had in school was related in any way to the jobs respondents were doing at the time of the interviews tended to throw more light on the value of education. Results to this question are reported in Table 3.

Table 3. Whether training received in school was related to job (data in percentages)

Type of School	Yes	No	Total
Continuation School	49.83	50.17	100.00
General Middle School	21.76	78.24	100.00

The data here seems very interesting and should be interpreted in relation to the data presented in the paragraph immediately above. Table 3 shows that half of Group A responded that their school training was not related to their present jobs. It should of course be noted, on the basis of data presented in Table 2, that a quarter of all those in Group A were unemployed at the time of the investigation. One would hence conclude that about a third of all those in Group A who were employed at the time of the investigation found their continuation school education unrelated to the jobs they were doing. On the other hand, over three-quarters or 78.24 per cent of all those in Group B responded that their training in school had no relationship to the jobs they were doing. Once again we should note that nearly half or 48.85 per cent of people in Group B were not working at the

time of the study. It is therefore more interesting to focus on the percentage of people in this category who found their school education related to the jobs they were holding. This percentage of 21.76 indicates that slightly over a fifth of all those who had had general middle school education found that their school training had some beneficial relationship to their jobs. As has been said earlier, people in this category were engaged on unskilled and "temporary" jobs like switchboard attendants, labourers, etc. The ability to read and write is obviously of great value in many occupations. It is therefore not very surprising that 21.76 per cent of respondents in Group B found their general middle school education related to their present jobs. Of all those who attended continuation schools, 223 were employed and of this number, 149 or 66.82% found their school training related to their jobs.

This information if of great value since it underscores the essential benefits of continuation school education and substantiates the objectives of the continuation school programme. It is also interesting to note that 61.20 per cent of this group of 223 employed Group A subjects found their jobs interesting and rewarding enough to want to continue with them.

Table 4 summarises the type of jobs engaged in by people in the two comparative groups. The total figures reported in the last column are those who stated that they were engaged in some paid employment. These figures have increased slightly to 235 and 143 for continuation and middle schools respectively, due to some respondents who were unemployed or partly employed claiming to be working in miscellaneous jobs. In general, however, it can be seen that job acquisition is easier for those who have studied trades like shoemaking, fishing, poultry farming and fitting and welding.

Continuation school/junior secondary school

The initial popularity of the continuation school project encouraged the Ministry of Education to submit proposals on a new structure and content of education for public discussion. As a result of comments and suggestions received, a public meeting was convened when a committee was set up to consider the Ministry's proposals and the comments expressed by the public. Among the "Basic Principles underlying the Proposals" submitted to the Committee were the following(1):

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(1) Ministry of Education, op. cit.

Table 4. Types of jobs engaged in by school-leavers

Type of School	Fishing	Metal and Blacksmithing	Poultry Farming	Piggery	Shoemaking	Fitting and Welding	Dressmaking	Hairdressing	Crop Farming	Miscellaneous	Totals
Continuation School	27	3	10	-	8	7	29	4	24	123	235
General Middle School	3	-	1	-	-	3	20	-	39	77	143
Totals	30	3	11	-	8	10	49	4	63	200	378

"(iv) practical programmes which lead to the acquisition of skills should be an essential part of all formal education;

(v) throughout the entire pre-university course, emphasis should be laid on:

a) the development of practical activities and the acquisition of manual skills;

b) the development of the qualities of leadership, self-reliance and creativity through the promotion of physical education, sports and games, cultural and youth programmes;

c) the study of the indigenous language, science and mathematics."

The Committee recommended that the last four years of the normal elementary school course, i.e. the middle school level, should be replaced by a three year junior secondary school course. This latter course is to incorporate the entire continuation school programme, and thus inject into the school system an element of skill development and vocational orientation. This attitude towards education seems to have gained wide currency and, in spite of the cost element involved, it is obvious that any government which attempts to reverse this trend will meet with very strong resistance.

Experiences gained

The first and most pertinent experience gained is that, for an educational change or innovation to gain credence and any level of acceptability at all, the views, comments and co-operation of the people at large must be systematically sought. A series of committees and consultations need to be held in order to identify the relevant issues in education to which the educator must apply himself.

The second serious factor to consider is the social context into which an educational innovation is to be introduced. Within the context of Ghana's ethnic groupings and inter-group rivalries, any innovation tested for experimental purposes in one area is considered as discriminatory and can cause serious social explosions. The original idea to set up only 18 pilot schools for a good length of time to allow for a proper evaluation was quickly discarded because of over-enthusiasm and inter-group rivalry. The entire project could have failed if the pilot programme had not been very quickly expanded. This of course has very serious implications for planning and funding, but the innovator must be flexible enough to react quickly to such situtations.

A third point that came out very forcefully is that one should not limit educational innovation only to the resources of the Ministry of Education. One must find related ministries, organisations and agencies whose interests and operations have reference to those of education and might therefore be of great help at the operational stage. The Continuation School Programme in its operational stage had on several occasions to rely heavily on the State Transport Corporation for the physical distribution of equipment, the Ministry of Health also assisted and so did the Ministry of Agriculture, It is essential to involve all such agencies right from the planning stage.

Conclusion

The Continuation School Programme in Ghana has come to stay. Perhaps the greatest impact it has made has been to conform people's ideas about infusing practicality into our educational system. It is necessary to quote here the comments of the consultant who conducted the formative evaluation study seven years after the setting up of the project.

> "It is pertinent to conclude this report on the note that in a new programme such as the one being followed by the Continuation Schools, tremendous results in 'attitude change' are not likely to show within a period of 5 years. It is not also easy to establish individual entrepreneurships readily. All these will take time. The evaluator is, however, favourably impressed about the programme and will recommend its continuation."(1)

This was the final summing up of the evaluator's report in 1976. Our own study conducted two years later did in fact show a positive correlation between the Continuation School and the individual's usefulness within the economic community and self-development. This being the major objective of the Programme as initially conceived, indications are that in time the generalised innovation will be successful in achieving its aims.

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(1) Agbenyega, C.O., The Ghana "Continuation School" Project: A Preliminary Review, Accra, 1976, p. 13.

ADMINISTRATIVE PROBLEMS ENCOUNTERED IN THE INTRODUCTION OF INNOVATIONS IN PERUVIAN EDUCATION THROUGH THE EDUCATIONAL REFORM OF 1972

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I. The Peruvian educational reform

In March 1972 the Peruvian military government approved a new education law for the country. Two of its features should be pointed out: on the one hand, it was considered only as part of a total programme aimed at transformation of the social and economic power structure in Peru, since other measures were being taken with respect to agriculture, industry, mining, banking and the administrative apparatus of the State. On the other hand, the law sought general reform of the orientation, structure and content of education to make it broader in scope and more democratic.

Eight years have passed since the adoption of the Education Law and much interest has been devoted to it by Peruvians and educators from other countries since the law was very ambitious in scope and progressive in outlook. Evaluations undertaken by several organizations have described the various achievements as well as some of the problems of applying the law, the mandate of which is still in effect but is under evaluation by the new Peruvian government elected in May, 1980. Some of the educational studies suggest that the problems stem from the law itself since it was not based on sufficient research as to available financial and other resources. Others indicate that its preparation was carried out without sufficient participation of teachers and university professors. Yet others say that the problems were a reflection of serious problems faced by the government in the implementation of other economic and social reforms. Links to the actions of teachers should also have been created, especially given the insistent and unsatisfied demands of teachers for economic improvements and

the lack of clear policies for the economic and social welfare of teachers which led to the growth of a strong teachers' union and to strikes of long duration in 1978 and 1979. Other criticisms indicate that the Ministry of Education was not equipped administratively to face the challenging role assigned to it in reorganizing the educational system. The administration should have constituted the principal means to apply the law, adopting mechanisms and procedures to permit the carring out of actions within planned schedules.

The following comments attempt to briefly analyze the role exercised by the educational/administrative structure in the implementation of four major facets of the Education Law: (i) planning for the process of change from the traditional structure to the new educational system; (ii) the system of "nuclearization" of educational units; (iii) the training of teachers for the purpose of using a new curriculum in the classroom; (iv) the design, production and distribution of new instructional materials.

II. The need for a plan to change the educational system

In order to set the new system in motion, the section of the law which refers to transition measures points out that the application of the new educational system must begin "in accordance with the General Plan of Conversion of the Educational System formulated by the Ministry of Education". It also adds that with respect to the universities, their Plan of Conversion must be formulated by a representative body of the university system and presented to the Ministry of Education for coordination with the General Plan of Conversion.

As to formulation of the General Plan, the Law also included a group of articles which stated the form in which the following should be accomplished: the application of nuclearization; the conversion of educational centres and programmes; the retraining of teachers in accordance with a strategy for converting grades, cycles and educational levels; the reorientation of programmes for teacher training and the university reform. A timetable for the formulation of the Plan of Conversion was not established; however, in the case of the by-laws, a term of 120 days was set for their formulation following the approval of the Law.

The question of planning total reform of the educational system was a tremendous challenge for the authorities responsible at that time for the conduct of educational policy, especially since planning has only recently

been attempted and that administrative and human infrastructure have been lacking in the area of educational planning. The Plan of Conversion was supposed to specify the details for implementation of the Education Law. Putting the new system into action would require many studies to allow the definition of priorities for development, stages of application, the finances needed, the needs of teachers and the mechanisms and procedures which the administration should adopt to ensure the adequate application of legal and other provisions.

The preparation of alternatives for change began long before the Education Law was approved. From 1971 to 1975 several alternatives were designed. The most ambitious one, which figures in the Plan of Education 1971-1975, stated that the new educational system should be widely adopted within a five-year period (1977). Another alternative, which figured in the revised Plan of Education approved in July 1972, extended this period to nine years (1980). Although no new schedules were officially approved, in the Plan of Education for 1975-1978, which was only a proposal, a programme was drawn up with a timetable of 13 years (1984). It should be pointed out, however, that many of the ideas contained in these later alternatives have already been replaced or are currently exhibiting serious shortcomings following their adoption.

In general terms, it can be said that the design of alternatives for conversion include the following characteristics: gradualness (in the sense that the new educational grades are to be applied on a small territorial scale during the first year, expanded in the second year and then generalized throughout the country), progressivity (an educational grade will apply only if during the previous year the preceding grade also entered into the reform phase), congruence with the development strategies of other sectors (initially the educational reform took into account geographical areas where actions primarily related to agriculture were taking place. Furthermore, a Permanent Council for Educational Coordination was created as the organization responsible for linking the action of the Ministry of Education with that of other sectors), and for ensuring participation of the national community and of external sources in the financing of education.

The reorganization of the administrative and financial apparatus, nuclearization, and the retraining of teachers were established and pre-requisites for the conversion of educational levels and practices. No educational grade was to be changed unless there already existed a communal educational nucleus (NEC) and each area under reform was under the responsibility

of a teacher who had been retrained. The purpose of administrative reorganization was to harmonize the structure and functions of the Ministry of Education and its dependent organizations according to the provisions of the Education Law. In order to facilitate the planning and execution of educational activities, five operational levels were established: that of the central-national level, which establishes national norms and which, by definition, must consult with lower administrative levels; those of the regional and zonal levels, which are in charge of the functioning of educational establishments in regions or zones (excluding the universities), and which adapt the norms established at the national level to the specific characteristics of each jurisdiction; and those of the communal educational nucleus and the educational centre, where the educational activities are actually carried out. The administrative reorganization also anticipated the formation of work teams - direct participants in the planning and execution of actions. These teams were to create a simple and practical structure oriented toward distinguishing with clarity the technical-normative areas from the mechanisms of administrative support, with the aim of preventing the latter from absorbing and determining the technical-pedagogical function. The need to plan change resulted in strengthening the structure of the Sectoral Office of Educational Planning (OSPE), to which are assigned the functions of planning, budgeting, programming of the nuclearization process, rationalization of administrative actions, statistics and international cooperation. In 1973 this structure was strengthened by the creation of planning units within all the General Offices of the Ministry of Education, within the non-regionalized offices (in charge of teacher training, educational research and television education), the decentralized public organizations (including the universities), the regional offices and zonal offices and within the communal educational nuclei.

In order to coordinate the strategies, priorities and methodologies of educational planning, the Committee of Educational Planning was created. During the early years of its existence, this Committee served as a permanent mechanism for coordinating the activities of the reform, channelling important recommendations concerning the formulation and implementation of plans and programmes and articulating national and regional policies. Unfortunately, frequent changes in the leadership at the Ministry of Education, and changes in procedures relevant to decision-making, eventually led to progressive inactivity within the Committee and finally to its complete disappearance from

the administrative structure. For much the same reason, changes which had been introduced into the organization of the Sectoral Office of Educational Planning in recent years have come to be the responsibilities of other, independent organizations, particularly those relating to rationalization of administration, statistics and international cooperation.

The new educational system began with the functioning of 137 NECs; 157,600 pupils enrolled in the first grade of regular basic education and 12,900 participants in the first cycle of work-oriented basic education. In 1980 all services associated with initial education are in the form of new programmes; 98% of pupils enrolled in the first six grades of regular basic education are following reformed programmes; and approximately 98,000 pupils will graduate from the ninth grade of newly reformed study programmes. Work-oriented basic education has been extended since 1979 and the first cycle of higher education is beginning to expand, albeit slowly and amid great difficulties. The universities, however, continue to function under traditional, pre-reform patterns. In quantitative terms, the fact that only 35% of pupils are studying under the old, educational system suggests that the implementation of the Peruvian educational reform has proceeded at quite a dynamic pace. Nevertheless, a lengthier, more careful analysis is needed in order to evaluate change in qualitative terms, as follows:

(a) Changes in timetables which had originally been established for putting the proposed changes into effect occurred for a number of reasons. Perhaps the most important one at the moment the reform was being planned was the anxiety, among political decision-makers, to see the new educational system established in the shortest possible time. There was a tendency to disregard the opinions of various technicians and of international organizations such as Unesco and the World Bank, which warned of the dangers which could result from accelerating the pace of the reform. In addition, the provisions suggested by the Plan omitted a factor of serious, financial importance: the policy governing changes in teachers' salaries. The Plan of Conversion furthermore stipulated that studies should be undertaken within the shortest possible time, to establish the role to be played by education in the formation of human resources

needed for national development; those studies were begun in 1977 but were later discontinued due to problems caused by policies reducing numbers of personnel.

(b) The elaboration of new educational programmes and instruments was to be carried out in a progressive manner, proceeding in step with the creation of new grades. Only in 1977 was there a complete conceptualization of the sequencing of programmes from the initial education level to the first cycle of higher education. It is likely that there were also limitations in the capacity of technical-pedagogical organizations to produce the necessary programmes and materials for the various grades at a faster pace. However, the failure to elaborate a complete or holistic view of the educational system created serious problems for the execution of pre-service and in-service training of teachers.

(c) Despite lack of a policy regarding teachers' salaries, the Plan of Education approved in 1972 estimated that educational costs would increase from 3.7% of GNP in 1971 to 4.4% in 1975. The priority for education announced as government policy was not put into practice, as can be seen from the progressive decline in the proportion of the national budget allotted to education, which was only 3.0% in 1978. It is also necessary to mention that during the course of the last five years, the severe economic restrictions experienced by Peru have substantially limited the possibilities of achieving the objectives of development of the educational sector.

In this regard, it should be pointed out that the educational administrative structure did not itself know how to respond to the need for resources. There are many who think that besides not being able to draw upon sufficient resources, the application of the reform was extremely ambitious - an effort was made to get quick results using methods which had not been sufficiently tested. (For example, the curriculum and its

associated instruments were put into practice without having been previously tried out and formatively evaluated using a small, pilot group of schools. This led to an abundance of new legislation, and to the continual change of both form and content in the programmes adopted.) There was also the problem that despite the limited resources available, bureaucratic structures were created which were so large that they could not be matched by a commensurate growth in enrolment. (Although the administrative staff and service personnel at the Ministry of Education and within the various educational regions and zones increased between 1976 and 1977 from 2,170 to 7, 496, in the case of staff in the educational centres, the increase was only from 8,877 to 11,054 workers. Similar problems of bureaucratization could also be seen within the structures of the NECs and the educational centres undergoing conversion.)

(d) The intention to offer an education adequate for all Peruvians implied, from the organizational standpoint, three fundamental conditions: an administrative structure which could (i) carry out a process of decentralization geared toward the transfer of power and authority to regional, zonal and nucleus organizations; (ii) ensure the full participation of citizens in educational institutions; and (iii) achieve coordination among the various components of the educational sector and with other sectors of Peruvian society, toward the end of assuring coherence and greater scope of educational activities.

With respect to the process of decentralization, actions undertaken during the 1970s have shown a tendency toward reinforcement of administrative capabilities and of planning at the regional and zonal levels, though to a lesser degree at the most basic levels. The regional and zonal offices have gained additional authority and responsibilities, especially with reference to personnel administration, the preparation of plans and budgets,

the administration of financial resources, and increasing technical requirements for personnel due to the design of permanent programmes to improve skills. On the other hand, some offices at the basic level have lost certain responsibilities which they had prior to the reform period, such as the administration of financial resources. Furthermore, such things as contracts, the elimination of jobs and transfers of teaching staff, administrative staff and service personnel cannot be effected without the prior authorization of the respective zones.
It is important to point out, however, that starting in 1975, changes in the leadership and political orientation of the government, brought about important changes in the conception of fundamental aspects of the Education Law, such as the desire for decentralization, participation and also the type of content to be imparted in educational programmes. For instance, programmes such as those concerned with literacy and further education decreased from being only limited in application to being practically abolished later. This situation, when added to the lack of clarity in government policies, generated within the Ministry of Education a continuing lack of precision with respect to what would be the future of the educational reform.

(e) Among functions to be developed by the administrative apparatus, perhaps that which was best developed was planning. The creation of a planning system provoked an interest, among those responsible for the execution of educational activities, in getting to know more about problems associated with developing an improved organization for educational work. This came about upon implementation at all administrative levels of the use of operational plans (both annual and biennial). Notwithstanding the progress reached in the development of educational planning, there is still not enough effort being made to render objectives operational. The economic crisis restricted the horizons for planning

almost exclusively to the short range, given that inflationary pressures from year to year were virtually unpredictable.

A World Bank mission which visited Peru in 1976 pointed out that great strides forward had been taken in planning the educational reform; however, qualitative actions undertaken were not achieved effectively, due to delays caused by the need to construct, transform or adapt the existing infrastructure. What seemed to be needed was more time in order that the administrative/technical staff - qualified and proven - might be made available for service at the decentralized levels. Of equal importance was the need to allow more time for developing instructional materials, improved educational technology and training programmes for service personnel and for disseminating these throughout the system. The limitations in the operational capacity of the administrative apparatus can clearly be appreciated given that levels of educational investment expenditure never surpassed more than 70% of the amount authorized in the educational budgets.

Follow-up of the Plan of Conversion is continuing. This mission was entrusted to the Office of Planning of the Ministry of Education, which relies on its Evaluation Unit for feedback. Three times a month, in accordance with the norms which governed the process of planning at the national level, OSPE issued evaluation reports which indicated progress made on activities included in operational plans, as well as limitations and deficiencies encountered. These evaluations, which due to their nature dealt more with quantitative and operational aspects, were not unfortunately accompanied by investigations which accurately measured the advance of the reform in qualitative terms. The need for an integral evaluation was responded to and undertaken in 1976, although its results, since they were never disseminated, are still unknown.

III. Educational nuclearization

One of the most significant innovations in the design of the new Peruvian educational system installed in 1972 was educational nuclearization, an organizational model oriented toward community access to decision-making on educational matters, rationalizing the delivery of services and stimulating the social aspects of the educational process.

The antecedents of nuclearization were not new, the concept having originally come from Bolivia. In 1945, under the auspices of a pact for

mutual cooperation between Peru and Bolivia, this model was applied in Peru under the name "peasant school nucleus". The purpose of the model at this time was to contribute to the solution of the Indian problem. The concept of the nucleus, as introduced in the Education Law, contains a number of features which clearly distinguish it from previous models: (i) given that it is conceived as the organizational foundation of the new system, it is presumed that as a model it will be institutionalized throughout Peru, not only in certain geographical areas; and (ii) it is regarded as one of the most important components of the move toward decentralization and also as a means for achieving the participation of the entire nation in the educational endeavour.

The NEC is the basic structure for all centres and programmes of initial and basic education which function within a predetermined, geographical area. One educational centre is selected from among several schools which offer the three cycles of basic education, or at least the third cycle, to serve as the main NEC office and as a base for the delivery of services to the other educational centres within the network. When distance and communication require it, one or more sub-centres may also be created. Administratively speaking, the NEC has the following structure: one NEC Director, the Communal Educational Council (CONSECOM), one Programmer, an Educational Promotion Team and an Administrative Support Unit.

CONSECOM is a counselling and evaluation body to the NEC Director, which seeks to institutionalize community participation in educational activities. It is usually composed of no more than twenty and no fewer than ten members of whom 40% are representatives of the teaching profession, 30% are representatives of parents, and 30% of other sectors and institutions of a social, cultural or professional nature, (excluding those of a partisan, political character). By law, this organization has to present to the Ministry of Education the names of three teachers, from among whom the Nucleus Director will be selected for a three-year term of service.

Similar work on the formulation of the Education Law required, starting in 1970, a definition of the basic components of a strategy to operate the nuclei. Thus, after having defined the conceptual framework (principles, doctrine and concepts of the nuclear model), a work plan was proposed which comprised the structuring of the nuclear networks (including the training of the necessary officials), experimentation with the nuclear model, the design of a timetable for putting the nuclei into operation and

the drawing up of regulations and an organizational manual on the functions of the NECs. During the phase of implementing the strategies, plans were also drawn up for a revision of the nuclear networks and of the personnel training modules, and for an overall evaluation of the process whereby the new system was to be extended throughout the country. All of this was to take place in 1976.

In 1972, the nuclearization effort succeeded in completing a first national project - a map of schools - which incorporated all public and private establishments for initial and basic education within the orbit of the NECs. 380 public officials from all over Peru were called upon and trained to carry out this project which took the following points into consideration: demographic aspects (the size and concentration of the population), territorial extension, means and access to communication, installed capacity of educational services and infrastructure already existing in the community and having potential use in education. Originally 861 nuclear networks were established; however, later adjustments put into effect between 1972 and 1976 reduced this total to 819 nuclei. In Huaraz (to the north of Lima) and in two small cities in the department of Cuzco, experimental nuclei were also put into operation.

The timetable for the adoption of nuclearization initially anticipated the functioning of 137 NECs (59% in zones with "adequate educational infrastructure", 22% in zones with "moderate educational infrastructure", 19% in zones with "insufficient educational infrastructure"). The basic strategy provided for necessary investments in the most needy areas in such a way that the latter would progressively enter into the nuclearization process. Between 1973 and 1975, 90% of the nuclei were to be functioning and by 1976, the total extension of the system was also to have been achieved according to budget provisions for nuclearization which also allocated resources for the revision of personnel manuals.

The functioning of the nuclear networks between 1972 and 1975 (the year in which all the nuclei anticipated for the country were established) was observed with special interest from the central level in cooperation with regional and zonal offices. It should be mentioned that the main problems encountered with respect to the uniformity of the networks were as follows: those related to the location of the central base (e.g., its strategic location in relation to other educational centres and pressures from groups within the orbit of the nucleus to have the seat of the nucleus established

in the community in which they resided); the need to either incorporate the educational centre within the network or to exclude it altogether; the dispersion of educational centres (especially in the rural areas) and problems of communication and distance.

With respect to the actions to be carried out by the NECs, these were initially defined when drawing up the policies of decentralization and participation of the new educational system. There was an implicit policy of self-management on the part of the NECs and of making sufficient personnel available to assume the various NEC roles and responsibilities. The NECs were assigned administrative functions (e.g., organization and coordination of educational programmes and centres within the network, rationalization of resources, studies and needs analyses concerning programming, statistics, materials and other resources for the zones); functions of a technical/pedagogical nature (e.g., evaluation of the various educational programmes offered by the NECs and organization of training to update teacher skills); and promotion functions (e.g., those related to obtaining a social input from the community). In order to develop their activities better, regulations issued by the Ministry of Education held that the nuclei (which were to be operational by 1972) should be assigned the following personnel: a director, three specialists and a secretary. This description was broadened in 1975 to include, in addition to a programmer, five teachers for the educational promotion team and three persons to help with administrative support. This meant that in order to fill the staff positions required by the 819 nuclei, 8,000 jobs would have to be created.

Many problems were encountered by the NECs in their attempts to carry out their responsibilities. A major one was the attempt to turn each nucleus into a small version of the Ministry of Education, such that everything which was done at central headquarters for a region or zone could be accomplished within the nucleus. The programme of activities which had to be developed by each nucleus was set up in hierarchical stages, each level of which required its own provisions and norms which were often uncoordinated and which usually resulted in duplication of efforts. The autonomy which had been hoped for could not be achieved, given that plans exceeded the real capabilities of the NECs. The manner in which some nucleus administrators judged work demands led to the reassignment of a large number of school teachers. (For instance, the number of persons who worked in nucleus administration in the nation's capital was between two and three times higher than the national average.)

A second problem, no less important than the first in the fulfilment of nucleus functions, was the financial one. The nuclei were implemented with very limited financial resources, a factor which greatly impeded the chances of successfully carrying out their technical-pedagogical and promotional functions. Thus, the educational promotion teams, not being able to rely on the resources necessary for travelling to the educational centres of the nuclear network, were converted, in many instances, into "office-bound educational promoters". A similar situation could be observed at zonal level with respect to the nucleus staff.

In practice, the existence of five hierarchical levels and the imprecise delineation of the attributes of each level, created problems of coordination. Often the zone altered management channels and levels while working directly with the educational centres, thereby altering the operations of the nucleus. In some cases, this led directly to a loss of authority among directors of the nuclei. On the other hand, the functioning of the nucleus directorate on the site of an educational centre frequently led to staff conflicts.

The CONSECOM, institutionalized as a vehicle for popular participation, sought to solve the problem of lack of citizen participation in institutions affecting daily life, especially within the urban setting. Before the adoption of the Education Law in 1972, the participation of parents and of the community in general was not altogether negligible, particularly in the construction of educational centres (whether by financial contributions or labour), but in the case of the nuclear model, participation was expected to go much farther to include community participation in educational decision-making and management. In the case of nuclei created during the early years, the establishment of many of the CONSECOMs was postponed due to difficulties in achieving the participation of local authorities and the community (possible because of the relatively scarce diffusion of the idea of the importance and benefits which might accrue to the community with the functioning of this consulting body). Little by little the terms proposed by the CONSECOMs for electing nucleus directors were set aside, with directors eventually being selected on the basis of direct coordination between the Ministry headquarters and its respective zones.

With nuclearization widely disseminated by 1975, the revision of the by-laws governing the operation of the nuclei and the initiation of a process of readjusting the nuclear networks, was judged necessary. Insufficient

financial resources to meet personnel requirements of the nuclei, and the difficulty of finding qualified personnel (capable and with experience), suggested the advisability of reducing the number of nuclei functioning in the country. On the other hand, a new turn taken by government policy after 1975 proposed a revision and reconsideration of some of the functions of the nucleus, particularly in the case of those carried out by the educational promotion team and by CONSECOM. Since then, educational extension and the CONSECOMs have been virtually dismantled.

In 1977 the number of nuclei were reduced to 802; at present only 642 nuclei are actually in operation. During this process of reduction, the administration has had to overcome great pressures from local communities - usually as a result of the fusion of one nucleus with another or the defining of a new centre base - and try to establish a just methodology to treat nuclei differentially according to their size, place of location, and the existence of an infrastructure which facilitates communication among schools in the nuclear network.

A new regulation covering the functioning of the nuclei was approved in 1976 and a more recent one in July 1980. The changing provisions for the nuclearization process lead one to believe that proposed modifications have not or would not be supported by studies to ensure an adequate margin of success. The various eruptions of union agitation and change of authorities in the central and regional administration have, for the most part, created an unstable environment in the nuclei, whose personnel have been moved continually in the last few years.

In this article an attempt has been made to outline the major problems encountered in the adoption of the nuclearization model. Despite the technical limitations of the structuring of the networks, work carried out to date has served to consolidate the presently functioning nuclear model. The process of physical planning has permitted a better knowledge of the reality of the country and of the deficiencies presented by the system in the face of a lack of material resources and the lack of integration of existing services.

The Centre for Educational Research and Promotion (CIPE), in its study "Educational Reform and Nuclearization in Peru", summarizes in a very precise manner the successes and the limitations of the nuclear model in fulfilling the tasks assigned to it:

"... given the functions of the communal educational nucleus, while disregarding that of participation, it can be pointed out that nuclearization has advanced most clearly in two aspects: administration and planning and the technical-pedagogical area. It is not that the model cannot cover all aspects; what has happened is that in practice there has been an increased concentration on those areas which seemed to present the fewest problems for the internal administrative machinery in that sector. On the administrative and planning level, information and analysis extended beyond the local community, allowing a more detailed appreciation of Peruvian reality at the microsocial level. Notwithstanding limitations and incompleteness in achieving a diagnosis of the situation, the administrative and planning effort has reached the local level, has allowed a certain familiarity with instruments for analyzing and interpreting reality, and has given rise to the perception that such work has meaning, purpose and links with regional and national planning for Peruvian development. From the technical-pedagogical point of view, despite all of the shortcomings and limitations listed, nuclearization had led to: more support for the classroom teacher, a better perception of equipment needs, and also the first estimates of the magnitude of problems which stem from both curricular diversification and from evaluations of regional or local cultural peculiarities. With regard to administration, it seems clear that the nucleus needs greater unity as regards its personnel policy and its financial and budgetary administration, as well as a progressive assumption of duties which will culminate in the granting of complete autonomy. With regard to planning, it would seem that it is necessary to institutionalize communication and decision-making channels which will allow central planning to pay more attention to requests, ideas and suggestions from the local bases without favouritism. At the same time, orders from the centres will also be subject to differential treatment at the base. In other words, participatory planning, which is the heart of the nuclear model, must be initiated. Also, with respect to the technical-pedagogical aspect, it becomes more and more evident that curricular diversification to recognize the cultural variety of Peru will be a long-term task with far-reaching consequences, such as the application of regionalization models. But this curricular diversification also requires further training of personnel to conduct participatory educational research, to generate and produce educational materials and to put new methodologies into operation. Thus, the necessary field work for this is likely to be large scale and challenging".(1)

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(1) Cardó, F., Andrés; Vargas, V., Raúl; Díaz, D., Hugo, Lima, 1980.

IV. Teacher retraining programmes

In the application of the new Education Law, three types of activities aimed at improving the qualifications of in-service teachers could be distinguished: retraining, in-service training, and specialization.

Projects which had been carried out in this field prior to the approval of the Law were mainly concerned with in-service training and specialization. Retraining was an innovation brought by the Law; its purpose was to offer in-service teachers (those in the classrooms and those carrying out technical-administrative duties) a means of obtaining information which would facilitate the application of a global strategy to change from the traditional system to the new educational system. Retraining had three primary objectives: to convey knowledge to teachers about instruction technologies and methodologies which would allow them to achieve in their work all the dimensions of educational activity required by Law; to develop qualities in teachers which would enable them to participate fully in the new system; and to train directors and promoters for the new educational system. Retraining is considered as an activity of a permanent and obligatory character, and must be taken into account in appointments, promotions and recognition of merit.

In order to plan, direct and coordinate the above types of training programmes the National Institute for Research and Development in Education (INIDE) was created. INIDE was also placed in charge of promoting and carrying out research in education of elaborating and disseminating instructional materials, and of accumulating and distributing scientific documentation on education in response to national educational needs.

The programme of activities designed for retraining had to be implemented in a progressive fashion and established as a prerequisite to the start of new programmes of study at the educational centres (a previous reform measure had scheduled retraining activities in such a way that teachers received new programmes of study without having had adequate instruction or technical preparation for them). In addition, due to the extent and coverage of its activities, retraining had to be decentralized in both formal and non-formal education. The retraining strategy comprised two types of activities: those prior to retraining for the formation of staff who would conduct the retraining programme (preparation of trainers, preparation of the content for retraining classes, decentralized organization); and the actual retraining of teachers. A total of 400 trainers

and officials of varying levels and specialities who worked in administration were instructed in the Courses for Trainers of the Education Reform (CEPRE). Teachers with a broad cultural base were selected as trainers, preferably those who had graduated from universities and who worked in secondary education. Once their courses had been completed, the trainers organized themselves into groups consisting of a coordinator and teachers with specialities in the various areas covered by the programmes and went out to work in the various zones of the country. Administratively, the staff was responsible to INIDE.

Initially, the retraining programme was designed to cover a period of 19 months. In the first year there was to be a period of five weeks of instruction, a follow-up activity and television education for the next eight months. In the second year correspondence courses were to be put into effect. Financial problems in 1972 led to the reduction of the retraining period to 11 months consisting of concentrated instruction for two-and-a-half months and then follow-up activities during the remaining time. Programmes contained two basic types of content: the technical-pedagogical and the ideological-political. The former covered the areas of educational technology, teaching methods, theory and techniques of curricular design and diagnosis and evaluation. In the case of ideological-political content, this was aimed at disseminating the purposes of the new model for Peruvian development as well as the educational model proposed by the new Law.

By 1972 the retraining programme had covered all teachers in initial education, the first grade of regular basic education and the first cycle of vocational basic education. Between 1972 and 1978 the number of retrained teachers reached 88,469. Beginning in 1974 teachers were organized into functional retraining groups by educational nuclei and speciality or level at which they worked. Due to the importance of this process, in 1976 INIDE set up an investigation for "Linear Evaluation of the Peruvian School Teacher" - oriented towards determining the efficiency of retraining programmes in terms of cognitive and attitudinal benefits to the teachers. Among the conclusions of this study were the following:

- In three evaluations of retrained teachers, in all the zones sampled, there was a significantly higher gain in knowledge and in attitudes acquired compared to teachers who had not been retrained.

- The gains achieved by retrained teachers increased progressively and this was confirmed for attitudes but not in the case of knowledge. During the period 1973 and 1975 figures for benefits measured in terms of knowledge acquired fluctuated between 53% and 57% and between 58% to 69% for teacher attitudes.
- In general no correlation was found between the benefits to retrained teachers and student achievements at the initial and regular basic education levels. It is necessary to point out, however, that students at the initial education level showed markedly more positive attitudes with respect to cooperation.

The Planning Office of the Ministry of Education has pointed out benefits which resulted from the formation of functional retraining groups. Working in teams permitted discussion, criticism, and especially the exchange of experiences among teachers. Teachers had an opportunity to appreciate the achievements and the mistakes of the new system and to continue to work towards developing an improved formula for educational change. There were, however, a number of difficulties throughout this retraining process. From the standpoint of planning the retraining programme, two problems should be mentioned: firstly, for several years a high percentage of teachers adopted the role of critical spectators of the process of implementing the new system, since they had not participated in the retraining programmes (only recently have secondary education teachers been reached by the retraining effort, i.e., in 1978 when the conversion of secondary schools began). Secondly, the directing of retraining toward classroom teachers and directors of one-teacher schools during the first year of the reform produced a situation in which the teachers in other schools knew more about the new system than their directors. The criteria for selecting trainers also generated difficulties - especially when the trainers found themselves face to face with teachers who had been teaching traditional primary school programmes. Thus, when some trainers taught pedagogical aspects of the first years of basic education programmes, they were not well received by teachers because their teaching experience was at other levels and in other educational specialities.

As previously mentioned, the period of retraining was set in 1972 at eleven months. However, the need to retrain more than 140,000 teachers

at a time of continuing financial problems meant that in practice, the period for retraining was reduced to three or four weeks, leaving follow-up activities subject, in great measure, to the initiative of the trainers and later of the zonal offices which managed to get resources for supervision and counselling. In the case of retraining teaching staff working in rural areas, apart from the problems of mobilizing resources and transporting teachers to the course centres, there was also the initial difficulty of the existence of a certain number of teachers who were unqualified and who did not have secure employment. It was difficult to create programmes of retraining for teachers with heterogeneous backgrounds.

The same problems of costs and administration obliged decision-makers to make continual changes in the provisions for retraining. In the educational zones there were problems in coordinating those activities being carried out by INIDE's trainers and those related to the technical-pedagogical aspects of programmes, which were taking place in different zones. Having in the past acted with relative autonomy from the zones, the trainers were now forced to depend directly upon them. This led to a progressive transfer of responsibility for the execution of retraining programmes, first to the zones and then to the NECs. It should also be pointed out that notwithstanding the fact that by definition, the central level was pre-eminent in the development of educational norms and activities, leaving the implementation of retraining in the hands of the regions, zones and nuclei, this still meant that the content and the instruments remained under the control of central headquarters. In the technical-pedagogical area, decentralization would have achieved better results if the functions and responsibilities delegated to the zones and nuclei had been directly linked to design of appropriate educational programmes. In this respect, the paternalism of central headquarters is clearly evident.

Thus, retraining programmes required as a first priority that the offices of the Ministry of Education and of INIDE should define the content of new programmes corresponding to the grades in which the reform was being implemented. Usually, the design of programmes was subject to great delay due to the fact that the curricula were drawn up in detail and that procedures for approving new programmes were slow. As a consequence of such delays, retraining courses were reduced primarily to the treatment of doctrinaire aspects, to information on teaching methods and to elementary exposure to scientific knowledge and other disciplines. The resulting

emphasis on ideological-political aspects and the manner in which these were taught (expository and reiterative methodology), were often interpreted by the teachers as a form of indoctrination which led to rejection of the retraining. Paternalism on the part of central headquarters was equally evident in the constant issuing of guidelines and provisions which stated almost everything that the teacher had to do in the classroom (which programmes to adopt, how to apply them, with what instruments, etc.). The margin for variation was virtually eliminated, and the teacher was converted into a mere resource, intended to function in a routine manner, and deprived of his or her capacity for initiative and educational creativity.

Another problem presented by the implementation of retraining was the slowness with which the administration acted to distribute material required for retraining courses (curriculum, guides and other materials). One study on this subject stated that:

> "Each year in the month of March a certain amount of material was required, corresponding to the number of teachers who were to be retrained. The process of designing, printing and distributing this material - which included the respective curricula - required a minimum of two years and two months for delivery into the hands of the teachers in retraining ... There have been cases of limited retraining due to the lack of newly designed curricula."

This study also pointed out that delays in payments for retraining courses and in remuneration to teachers led to a climate of discontent which in the long run heightened the tensions which retraining, in and of itself, had created.(1)

The problems encountered, changes in orientation of educational policy and the deepening economic crisis contributed to the decision that starting in 1977, retraining would be carried out only through distance education, that is, through the mailing of documents for study, and the use of radio and the press as complements. Apparently the decision was also made to avoid large concentrations of teachers in residential coarses leading to political demonstrations in support of matters having nothing to do with the goals of retraining programmes.

The strategy chosen required that teacher training programmes offered in the universities and in the colleges be tested as quickly as possible after the enactment of the Education Law. As a consequence, new

(1) Alba, Julia. Estructura Social, Desarrollo y Educación en el Perú, Lima, 1977.

programmes for the first year of teacher training were adopted in 1976. This meant that teachers trained in previous years would need retraining and that the necessary coordination between those responsible for teacher-training and for retraining would have to be organized. In a 1978 evaluation study, Unesco pointed out the necessity for Peru to establish an integrated plan of development for teacher-training in accordance with the innovations of the educational reform and the continued expansion of the system. Furthermore, INIDE in its Plan of Operation 1980-81, referring to activities for professional preparation of teachers, alludes to the "absence of a coherent and integrated policy dealing with teacher-training". INIDE also warned that despite revisions of the retraining programme as of 1977, it was still necessary to revise the focus and content of the overall programme so as to emphasize the specific aspects of teaching methods, techniques and instruments, as opposed to the current general approach. This evaluation leads one to the conclusion that the treatment of the technical-pedagogical aspects of retraining programmes continues to be a major bottleneck.

The many problems of retraining do not, however, detract from the basic achievement of having institutionalized a permanent service for the professional preparation of teachers. This fact assumes even greater importance given that there has been a huge increase in the amount of knowledge necessary to develop good teachers, as well as the fact that in Peru today unqualified teachers still form approximately 35% of the whole.

V. Design, production and distribution of educational materials

One of the most noticeable deficiencies pointed out in diagnoses prior to the approval of the Education Law was the lack of an explicitly formulated policy of technological development. Without this policy, the improvement of educational programmes, methods and teaching equipment, as well as methods of evaluation, was made extremely difficult. The Law proposed the formulation of a policy for technological development which would range from scientific investigation leading to the creation of new techniques to the criteria for production of educational materials. Two fundamental requirements were sought: first, according to the goals of the reform, to establish programmes, methods, materials and instruments for evaluation adapted to regional and local characteristics and situations. Second, to encourage the creative and general participation of pupils, teachers and

parents in the production of educational materials, using resources existing in the community. This last requirement was necessary given that the allowances to traditional primary and secondary levels for all teaching expenses apart from salaries did not amount even to 1% of the annual budget per student.

The task to be undertaken in this field could be summarized as follows: to revise the structure of plans and programmes according to a new curricular doctrine based on the establishment of "lines of educational action"; and from this, to generate teaching materials for all grades of the new system, and prepare educational materials and instruments of evaluation relevant to the new curricula. Undoubtedly, this task was made much more difficult by the need to adjust the content of teaching to the aims of profound social changes.

Bearing in mind that educational materials were the main means through which the educational reform might improve teaching methods and course content at all levels, INIDE was made responsible for the design, preparation and experimental production of prototypes of educational material (texts, manuals, guides, resumé cards and illustrative materials printed for educational purposes). Once tested, INIDE was to prepare the materials for general distribution. Both tasks were to be carried out in close coordination with the technical-pedagogical normative offices responsible for the formulation of basic models for equipment and educational material, and the design and structuring of educational programmes. At the local level, the NEC were to undertake the invention, production and use of educational materials with local resources, stimulating cooperation among the educational centres of their respective locality. They should also participate in the process of evaluation, as well as the formulation of criteria and decisions in regard to the use of methods, techniques and didactic materials, suitable to needs and characteristics of their particular territories. Regional and national conferences were foreseen to encourage and facilitate the exchange of experiences.

This policy of technological development shows that to count on any single source to provide the multiplication of materials for the educational process would be unreasonable. Private enterprises which produce and test educational materials must obtain ministerial authorization; INIDE sets the technical norms which authors and publishers should follow. In general, norms stipulate that educational material should be tested experimentally

for a two-year period, at the end of which INIDE makes an evaluation of its use. If this is favourable, the material is approved for five years. In quantitative terms, it is encouraging to note achievements during 1970 to 1978, especially the richness and creativity shown by a great variety of educaticnal activities, equipment and materials, which, at times, profited from imported technology adapted to the needs of the new Peruvian educational system. This has helped in the modification of traditional educational activity and in the production of low-cost educational material as a factor to assist in equalising educational opportunity.

Evidently, the preparation and subsequent production of educational materials posed quite a few problems. These were of an ideological and technical/administrative nature, the former stemming from sensitivity in regard to language and culture. The latter arose from the fact that aspiration for real participation by the bases in a country of marked centralized tradition was found to create, among the officials at national level, the impression of loss of control of content, and the taking of initiatives which might seem parochial, regional or even damaging to national unity.

Although studies were carried out from 1969, many operational aspects required for the implementation of the educational programmes under the new law were not allowed sufficient time to fulfill the minimum stages necessary for the preparation of new educational materials (from investigations concerning their design to opportune and adequate distribution by educational centres). A recent evaluation of the reform, prepared by the Ministry's Office of Planning, points out that the lack of a conceptual framework to orient the curriculum was the cause of a number of modifications observed in the treatment of the curriculum. An effort was made, through the production of various documents, to unify the criteria for action, but these were very short-lived. Thus, the material produced by INIDE has shown various weaknesses, due in large part to the urgency to supply the new system with materials which impeded the checking and correction of errors.

Some areas of education, such as the Humanities, were the subject of a large number of political and ideological questions. With the change in direction of governmental policy after 1975, it was said, for example, that the areas of language and historical and social sciences were imbued with a strong political content which was contrary to the education which

should be given to the pupil. In contrast, in the areas of mathematics and natural sciences, which were based on methods of direct observation and participation by the student, the objections were of a methodological character, and fundamentally referred to a need to radically change teaching methods.

Administratively, the procedures established for the approval of educational materials were very lengthy and consisted of too many stages. In addition, in order to try to reduce costs, information was requested as to the sale price to the public, possible margins of profit, and possibilities of export to other countries. The number of requests for approval of materials was considerable and there was not enough qualified personnel to take care of it. This problem continued for many years, as very few efforts were made to simplify procedures. It might be asked whether it is necessary for all materials to pass through the approval process. In addition, what possibilities are there to authorize educational materials on an experimental basis for one or two years without a previous evaluation. The excessive red tape limited possibilities for the creation of new materials by private sector.

INIDE, in its Operating Plan for 1979-1980, pointed out that the lack of an inventory of educational materials produced by the state and by private companies, ignorance of production of educational material and its use at national level, plus the absence of a policy of production of educational materials - all resulted in duplication of effort, and lack of attention to certain subject areas. In addition, INIDE has no office to ensure that the prototypes of educational material and the results of successful investigations have the desired diffusion and utilization.

As for supply, lack of information concerning real demand for educational materials resulted in insufficient or unnecessary distribution in many cases. This situation was aggravated by delay in delivery of materials due to unnecessary and prolonged storage. In the reform's first year of implementation, the evaluation report of the Biennial Plan 1971-1972 pointed out that only 50% of the existing classrooms in 1972 contained equipment of new design. The additional lack of coordination between the supply and the technical-pedagogical offices at all administrative levels, and the lack of resources to finance a more rapid distribution, were causes of supply problems.

A policy of educational technology, described in general terms, was approved only in 1977. This insists on the importance of linking the work of the teams designing materials with those who evaluate material produced by various authors, and then linking both teams with those responsible for the drawing up of basic curricula. The lack of a clear definition of functions by field of action in the norms of the Ministry and of INIDE, caused problems in counselling regions and zones concerning the use of educational materials. As a result of excessive conscientiousness at the central level and the impossibility of meeting demands for technical help in the preparation of educational materials, production which should have been forthcoming at the local level was not of great significance. The scarcity of financial resources for the purchase of teaching materials in the educational centres was much worse than at the end of the 1960s, due to the economic crisis and inflation. Nevertheless, special mention should be made of efforts in the field of science teaching carried out with the collaboration of Unesco, as well as the work started in 1979, in coordination with USAID, in experimental production of educational materials at low cost.

VI. Experience acquired since 1972 by the Peruvian school system in the introduction of innovations

This report has attempted to synthesize the principal problems, especially the administrative ones, in implementing the innovations of the approved Education Law in 1972. The following conclusions are offered:

(a) The adoption of an integral reform of education in a developing country (which has not yet achieved minimal schooling for the entire population and which has a high illiteracy rate) requires that those responsible for defining educational policies establish priorities. Confronted with limited financial and administrative capacity, politicians and administrators who wish to obtain rapid results (without having previously developed the necessary conditions for achieving them) will have to rein in their enthusiasm to some extent, given that the solutions to educational problems and the introduction of improvements to the system requires realistic planning and scheduling.

(b) It is necessary to define precisely the principles which will sustain adoption for any innovation which is to be introduced into an educational system. It is also necessary to have the will to make the innovation a permanent feature. This will reduce, in part, the possibilities of ideological-political discrepancies, and will also avoid only superficial support being given to the innovation when it is implemented. In the case of Peru, the change in government policies in 1975 created great uneasiness and confusion in educational administration, which expressed doubts about the future of the reform given the progressive suspension of programmes such as functional literacy and educational extension, the diminished importance of the communal educational councils of the nuclei, and the extensive revision of the content of educational programmes. Evidently, if government objectives change in relationship to what is perceived as the correct social model for the future, the Education Law will undergo important modifica ions of its principles, especially since this legal document was conceived under conditions which no longer obtain.

(c) In the introduction of technical-pedagogical innovations, it is extremely important to open up channels of participation for and support by labour unions and university organizations in the design, programming and implementation of such innovations. By these means it will be possible to significantly reduce levels of rejection of new projects oriented towards improving the quality and efficiency of education.

(d) Generally, in the formulation and implementation of innovation projects, the criteria adopted for selection of personnel to take charge has been to search for professionals who have a solid scientific-humanistic background. This tends to disregard the basic experience needed for members of the administrative teams. In the Peruvian case, the use of sophisticated

language, the difficulty of training teachers in content, techniques and methods adequate for both the level of knowledge being imparted and the local realities in which teachers are working were major deficiencies due in large part to the fact that those responsible for designing the educational programmes, materials and instruments for evaluation had had very little classroom experience, and in some cases, none at all.

(e) Decentralization and participation as supports for the introduction of innovations require by definition: a change in staff attitudes with respect to the manner, form and levels at which educational problems must be resolved; the institutionalization of adequate mechanisms and procedures (delegation of functions and responsibilities, financial and decision-making autonomy); and the preparation of administrative personnel qualified for regional and local administration. The barriers to the consolidation of these processes are considerable and will require long-term strategies if they are to be extended throughout the country.

(f) The development of planning of education as a system and process in Peru has been outstanding, a fact recognized by various national and international institutions. Systematic planning, periodical evaluations and needs assessment have mobilized a large number of staff who are conscious of the importance of techniques of this type if development is to continue. Nevertheless, the harmony which should exist among administrative, planning and technical-pedagogical units in order to carry out reform of the system, has not yet been achieved. Proof of this is furnished by the disjunctions observed between the programming and execution of activities in terms of timing and coordination. One important reason for this was the difficulty encountered by the administrative structure in proceeding from national objectives to operational

objectives and innovation projects to implementation of educational policies. Another equally important reason was that stability of personnel in posts to form the basis of the new system was not ensured and the continual movement of staff and necessity to work under conditions of temporary appointments weakened their initiative; this factor also affected the administrative staff, who were not given sufficient authority to manage administrative matters.

The foregoing summary suggests that it is essential to establish training programmes which will: permit the diffusion and promotion of techniques for formulating objectives and projects at various administrative levels; feature to a greater degree long-term and medium-term planning, and also generate conditions which will give the local levels more stability and more resources so that they acquire greater autonomy of action.

(g) Despite its myriad problems, retraining has contributed to a change in teacher attitudes with respect to their profession and its social status, both of which have undergone a positive re-evaluation. The work of the teams for retraining at the nucleus level should be continued, given that they have facilitated the exchange of experiences and the development of creative potential in teachers to eventually improve both teaching techniques and the design of educational materials using local resources.

In the Peruvian experience of retraining, nuclearization, the design and production of instructional materials, and other activities of the newly reformed system, the resources destined for supervision, direct expenditures on instruction, and expenditures on infrastructure have been very limited. The new political consitution of Peru, in effect since July 1980, provides that the budget of the Ministry of Education must not be less than 20% of the total budget of the central government,

i.e., 7% more than that presently in force. Although this provision is quite encouraging, it is likely that the increase in resources will only be enough to enable the salaries of educational staff to keep pace with increases in the cost of living, and to cater for a growing student population. Studies on how to cut educational costs in some areas of education, and the granting of greater margins of initiative at the regional and local levels for solving educational problems, will become increasingly important in the coming years.

THE ADMINISTRATION AND ORGANISATION OF CURRICULAR REFORMS IN MALAYSIA: THE INTEGRATED CURRICULUM PROJECT

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I. Background information: the structure and organization of educational administration and management in Malaysia

Organizationally speaking, the structure of the national system of education in Malaysia is centrally based. Its administrative machinery is organized along four hierarchical levels: federal (central), state, division or district and school.

1. Organizational structure at the ministry level

At the Ministry level, the administrative and professional structure consists of 19 Divisions which carry out specific functions. These may be divided into sections. The first is the professional wing; the second the administrative. Of the 19 Divisions of the Ministry of Education, 12 are professional while 7 are administrative. Broadly, the former are involved in general planning, statistics, research and evaluation, curriculum development, staff and teacher-training, supervision, examinations, educational media and technology, technical and vocational education, etc. The professional wing is headed by the Director-General and his two Deputies, and each Division is under the responsibility of a Director. The seven Divisions in the administrative domain are involved in financing and accounting scholarships and training, higher education, establishment and services, overseas students' welfare and general administration; they are headed by the Secretary-General and his two Deputies.

The Minister of Education is the principal executive and he exercises his functions with the advice of the above-mentioned Secretary and Director-General. The decision-making process at the national level is entrusted to the following four Standing Committees who have responsibility for formulating general policy guidelines:

(a) Educational Planning Committee - the highest decision-making body of the Ministry concerned essentially with general policy matters;

(b) Central Curriculum Committee;

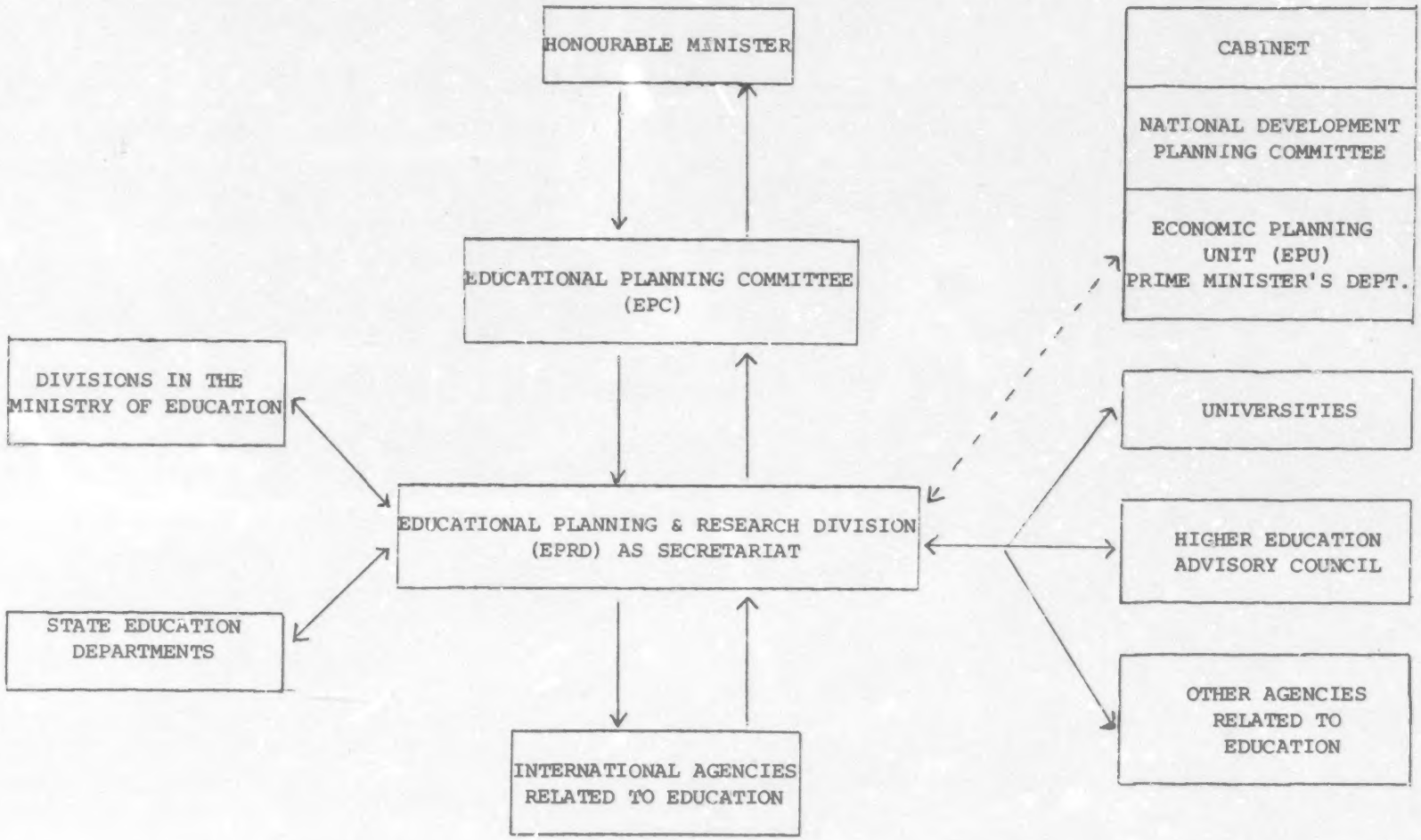
(c) Finance Committee, which examines all budget proposals and monitors overall expenditure;

(d) Development Committee, which formulates strategies and priorities for programmes and projects of the Ministry in terms of overall physical development.

The Educational Planning Committee (EPC), chaired by the Minister of Education, addresses its deliberations to the needs of overall educational planning and the evolving of procedures for coordinating the planning efforts of different units into a comprehensive education plan. The Secretariat for this Committee is the Educational Planning and Research Divisions (EPRD), whose Director is a member of this high-powered decision-making body. All other Divisions channel their proposals to the EPC through the EPRD which analyses such proposals and presents them to the EPC with its recommendations. It is in this way that EPRD performs an overall coordinating function of macroplanning activities, not only in regard to other Divisions of the Ministry, but with State Education Departments, universities, the Higher Education Advisory Council and with the Economic Planning Unit (EPU) of the Prime Minister's Department. The EPU, in turn, is responsible to the National Development Planning Committee (NDPC). The latter comprises members of all major economic development ministries under the chairmanship of the Chief Secretary to the Government. The structure of the operational model of educational planning at the macro-level is illustrated in Figure 1.

There are other committees at a subsidiary level which are entrusted with the function of coordinating various related activities in order to ensure the smooth implementation of educational programmes. Membership of these committees cuts across the various Divisions responsible for particular tasks.

Figure 1. Operational model of educational planning at the macro-level


HONOURABLE MINISTER
CABINET
NATIONAL DEVELOPMENT PLANNING COMMITTEE
ECONOMIC PLANNING UNIT (EPU) PRIME MINISTER'S DEPT.
EDUCATIONAL PLANNING COMMITTEE (EPC)
DIVISIONS IN THE MINISTRY OF EDUCATION
UNIVERSITIES
EDUCATIONAL PLANNING & RESEARCH DIVISION (EPRD) AS SECRETARIAT
HIGHER EDUCATION ADVISORY COUNCIL
STATE EDUCATION DEPARTMENTS
OTHER AGENCIES RELATED TO EDUCATION
INTERNATIONAL AGENCIES RELATED TO EDUCATION

2. State level

The State Education Department is headed by a Director assisted by a Deputy and a corps of professional and administrative officers. In executing programmes decided by the education policy, the Director is directly answerable to the Secretary-General and the Director-General of the Ministry of Education in all administrative and professional matters. However, in the States of Sabah and Sarawak, the Directors of Education are also answerable to the respective state's Chief Minister, especially with regard to the development of educational administration in their states.

The State Education Department performs the following administrative functions. The Director of Education:

(a) executes and implements education policy on behalf of the Ministry as provided for by the Education Act of 1961;

(b) administers, organizes and coordinates the running of the schools in the state with respect to staff and personnel establishment, finance and physical development;

(c) supervises educational programmes in the state (especially those concerning curriculum, educational television and school radio programmes, textbook loan scheme, school libraries, co-curricular activities, guidance and counselling, language, food and nutrition programmes, Malaysian School Sports Council and other related programmes and activities; and

(d) advises the Ministry wherever and whenever necessary on steps to be taken for smooth implementation of education policy.

3. District level

In some states in Peninsular Malaysia there is an administrative unit at the district level. In most cases, where they exist their supervisory function covers more than one administrative district. The administration is carried out by the District Education Officer with the assistance of several professional and clerical staff and school organisers. whose responsibilities include the coordination of functions and activities at school level for the implementation of education policy.

4. School level

At the school level, the headmaster is the administrative and professional head and is supported by a senior assistant, teachers, clerks and other non-professional staff. His duties include general administration of the school; supervising implementation of the specified curriculum and additional education programmes such as educational television and school radio programmes, guidance and counselling, library, co-curricular activities and the like; supervising and promoting extra-curricular activities as underlined by the Ministry such as sports and games, organizations and clubs, etc., and providing leadership in fostering positive and effective relationships with parents and the public through Parent-Teacher Associations and Boards of Governors.

Organizationally, the Malaysian education system is a centralized one but within its framework it allows for some degree of flexibility and adaptability in the implementation process as long as this does not contravene the education policy.

II. The pilot development of an integrated curriculum for the first three years of Malaysian primary schools

1. Introduction

In June 1974, the Ministry of Education launched a three-year pilot project aimed at developing, testing and evaluating an improved lower primary school curriculum. It was proposed that the curriculum would cut across the subject matter boundaries that currently exist between subjects, and, by so doing, the child's education would be a more meaningful, integrated and holistic experience. The proposed curriculum was to be constructed and developed in such a manner as to provide the child with as much first hand experience of the world in which he lives as possible. In this manner the curriculum would enable the child to acquire knowledge, understanding, skills, values and attitudes so that he may perceive relationships more easily than if he were made to master isolated skills on particular components of knowledge and left to make his own synthesis, a feat which may be beyond the capability of the child at that stage of his psychological development. The proposed approach attempted to integrate content, teaching methods and curriculum materials.

The objectives of the project were as follows:

(a) to design and develop an integrated primary curriculum for Grades One to Three, based on the need to inter-relate

and integrate the educational experiences of children during the first three years of schooling;

(b) to experiment with, evaluate and recommend improved teaching methods which are child-centred and activity-oriented;

(c) to develop teachers' guides and related pupils' materials; and

(d) to develop strategies for implementing the improved teaching content, methods and materials in schools.

The Integrated Curriculum Project was an effort to meet several "perceived needs". The existing primary school curriculum is subject based; it is made up of prescribed courses of studies organized in the form of separate subject syllabuses. Furthermore it is merely a vertical sequencing of subject matter from the primary to the secondary level.

It is felt that the primary curriculum should encourage the child to diversify his interests, provide him with the opportunity to pursue his individual interests, and assist him to discover his individual potential. In this connection, it is vitally important that a linkage is made between the world of schooling and that of the outside environment. It should be mentioned that acceptance of curricular innovations by teachers has been rather slow. This is largely due to the fact that teachers possess insufficient knowledge of both methodology and application with respect to new curricular materials and contents. Furthermore there is a general reluctance on the part of teachers to change their pedagogical styles and adopt new ones.

2. Stages of development

Twenty two schools were selected in 1978 as pilot schools, and seven others as laboratory schools. In making the selection care was taken to ensure that a representative sample of schools based on geographical location and school size was obtained. In November 1978, the Curriculum Development Centre (CDC) organized a ten-day orientation course for the headmasters of the 22 pilot schools. Four organizers of schools from the State Departments of Education also attended.

In 1979 weekly visits were made by officers of the CDC to the seven laboratory schools to try out certain curricular materials that had been developed for the project. The materials produced have been used to

familiarize teachers with the principles that underlie the new operation so that they come to appreciate them and are able to create additional curricular materials and activities in line with the idea of an integrated curriculum.

The project team also visited the 22 pilot schools to work with the teachers. Throughout the year workshops were held to discuss problems and produce teaching materials. Subsequently, a second six-day course was organized for the 22 headmasters and the 4 organizers of schools and during the first half of 1980, workshops were organized by the headmasters with the assistance of officers from the CDC.

Formative evaluation was also carried out to provide feedback to adjust and correct the project. It focussed on the processes as well as on the product of the curriculum viz:

(a) teacher effectiveness in terms of new, improved teaching strategies;

(b) pupils' learning outcomes;

(c) organizational and structural changes; and

(d) effectiveness of teaching/learning materials.

The curricular innovation is therefore still at the experimental stage. However, by the end of 1980, the reform will be implemented on a progressive basis starting with a small scale application. Formative evaluation of the innovation will be carried out in the seven schools and the outcome of the evaluation will have major implications for policy decisions with regard to the future of the project.

3. Procedures of the project

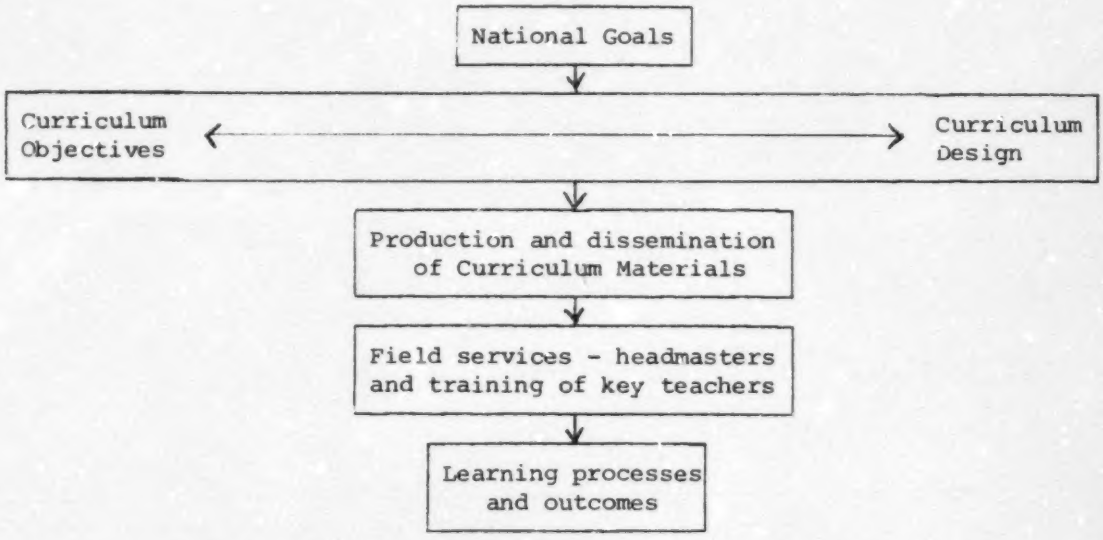
The procedures necessary to organize the experimental project were undertaken in phases. First the national goals of education were translated into curriculum objectives. A course of studies based on the new curriculum was then developed.

Next, the prototype instructional materials were developed, passed through certain processes, and a formative evaluation was made. The materials were modified and were again pre-tested before they were released to the pilot schools. Feedback from teachers and learners with regard to their reactions to the new curricular materials was obtained.

In-service courses were given to teachers of the pilot schools in order to orient them with regard to the new curricula materials. Finally, the new materials were disseminated to the 22 schools.

The above procedures are diagrammatically represented in Figure 2 below:

Figure 2. The process of curriculum design and development

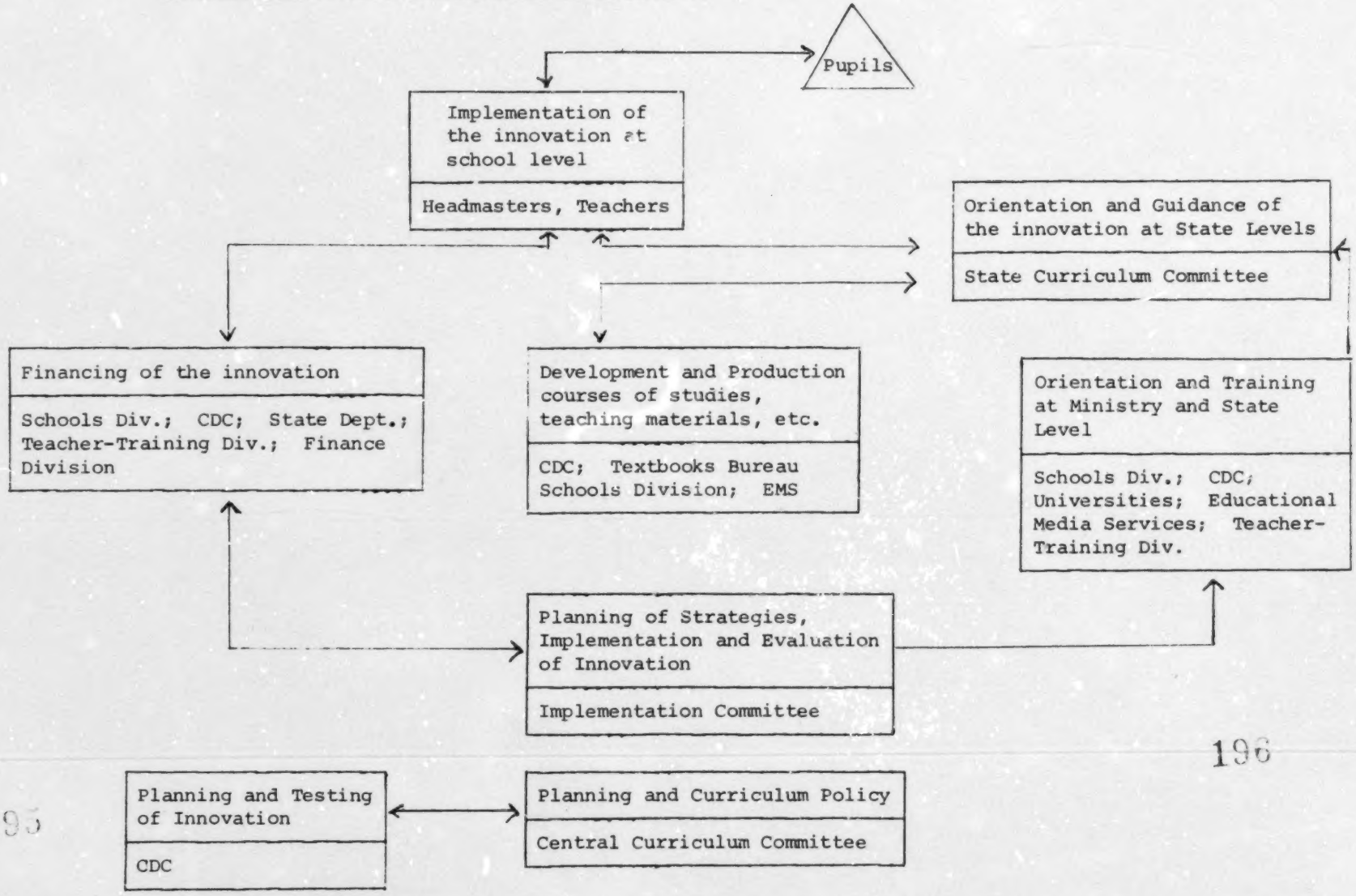

National Goals
Curriculum Objectives
Curriculum Design
Production and dissemination of Curriculum Materials
Field services - headmasters and training of key teachers
Learning processes and outcomes

The introduction of this curricular innovation involved a number of agencies and the linkages between them are shown in Figure 3 (in fact the plan for the dissemination of this innovation is also part and parcel of the overall curriculum design master plan). The figure shows the processes in terms of phases of implementation; the tasks involved in each step, the role and function of all internal and external agencies involved in each task and in the entire process; the identification and utilization of available resources; and the need to cost the whole operation. Figure 3 also shows that the project team comprised curriculum developers, teacher educators, state directors, supervisiors, educational media personnel, educational administrators and the like.

4. The administrative arrangements for generalization of the project

The Central Curriculum Committee, under the chairmanship of the Director-General of Education, is the highest decision-making body in matters pertaining to curriculum. Figure 4 outlines the way in which the project, if accepted by the Central Curriculum Committee, will be generalized. It can be seen that the Curriculum Development Centre is the body responsible for developing and disseminating curricula and curricular materials to the nation's schools.

Figure 3. Strategy for curriculum design and development


Pupils
Implementation of the innovation at school level
Headmasters, Teachers
Orientation and Guidance of the innovation at State Levels
State Curriculum Committee
Financing of the innovation
Schools Div.; CDC; State Dept.; Teacher-Training Div.; Finance Division
Development and Production courses of studies, teaching materials, etc.
CDC; Textbooks Bureau Schools Division; EMS
Orientation and Training at Ministry and State Level
Schools Div.; CDC; Universities; Educational Media Services; Teacher-Training Div.
Planning of Strategies, Implementation and Evaluation of Innovation
Implementation Committee
Planning and Testing of Innovation
CDC
Planning and Curriculum Policy
Central Curriculum Committee

Once the new curriculum is accepted by the Central Curriculum Committee, preparations will be made for its introduction by informing the Faculties of Education of the various universities in the country and the Teacher-Training Colleges of their role in the programme. Almost inevitably a massive programme of in-service training of teachers will be required, and the various methods by which this can be done will have to be worked out by the different agencies of the Ministry such as the Schools Division, the Inspectorate, the Teacher-Training Division, and the Finance Division.

Other concomittant factors that need to be considered before the innovation can be generalized are:

(a) the production of suitable textbooks;

(b) legalising the new syllabus;

(c) new tests and examinations at Grade III and Grade IV levels will have to be formulated;

(d) the system of school time-tabling will have to be worked out;

(e) the Educational Media Service will have to modify its regular programmes to suit the new syllabus; and

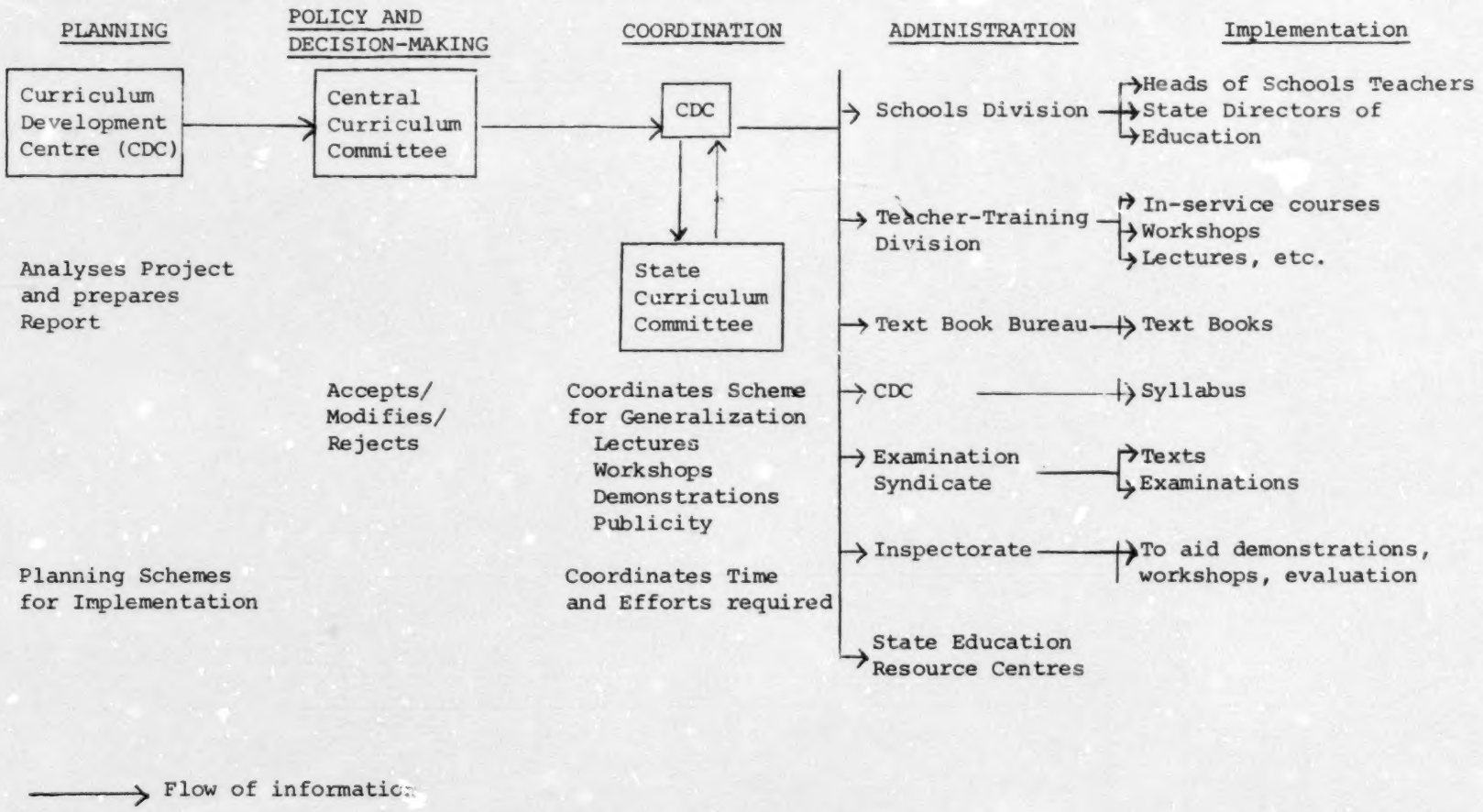
(f) measures should be taken to familiarize all State Curriculum Development Committees, the Educational Resource Centres, the Teachers' Unions, and Parent-Teacher Associations with the new syllabus.

Apart from the Central Curriculum Committee, the State Curriculum Committees and the State Educational Resource Centres are also responsible for implementing curricular programmes.

The State Curriculum Committees

A State Curriculum Committee has been established in every state in Malaysia. It is manned by professional officers in the State Education Department, together with representatives from the local Inspectorate of Schools, the local principals of teachers' colleges, headmasters and senior subject teachers. When a curriculum is introduced on a nation-wide scale, it is the task of the State Curriculum Committee to ensure its smooth implementation.

Figure 4. Administrative arrangements for the generalization of the innovation



The State Educational Resource Centre (ERC)

The ERC is a professional centre the function of which is to provide guidance and services to school teachers in matters pertaining to teaching techniques and methodologies, material development and production, classroom control and management, etc. The ERC is also envisaged as an information centre for the dissemination of current ideas and developments of teaching and learning. Initially established in four disadvantaged states, with plans for wider national coverage, the ERC is a deliberate attempt at decentralising the provision of educational services, in the hope that local needs will be met more effectively.

5. Administrative problems to be taken into account in the generalization of the project

The project at this juncture has yet to be generalized and therefore it is not possible to discuss the administrative problems and shortcomings in implementing the innovation. However, it is possible to anticipate some problems that might be encountered based on experiences gained in the course of testing the project.

It has become abundantly clear that without the full involvement of the classroom teacher, projects concerning the classroom process will almost certainly fall short of the objectives set for them. The problem that currently confronts the project authorities is how best to enlist teacher involvement. The solution seems to be that the teacher should not only be given the necessary professional and moral support, but the Ministry should provide him with the necessary assistance and support services on a continuing basis. This means that a measure of direct organizational and supervisory control is inevitable. The key role of the headmasters in curriculum implementation needs to be recognized and appropriate in-service training should also be provided for them.

Unlike the regular curriculum that is currently in practice, the new curricular innovation is conceived in terms of the blending of activity with experience, rather than purely in terms of the acquisition of knowledge and facts on the part of the pupil. The new curriculum also aims at developing in the child fundamental human capabilities and arousing in him an interest in the whole spectrum of community life within his compass. The new curriculum implies that teaching, instead of merely imparting knowledge as is now the case, should place before the child problems that challenge and motivate him to use his faculties to seek his own solutions.

In deciding to generalize this innovation the following points should be considered. In the first place there is always the danger that a new method may exceed the limits set for it and thus bring about unanticipated consequences. For instance, while science, language and mathematics may at times be blended together in the teaching of a lesson, it is possible they may be merely dragged in rather deliberately, thus making the learning process, not a natural, but an artificial one.

The next question which inevitably arises in connection with the new curricular approach (an approach which essentially calls for a radical departure from the traditional style of teaching) is this: if reading and writing are utilised only in connection with the working out of projects, and if the teaching of science and mathematics are only episodic, what guarantee is there that the stipulated curricular basics will be covered by the end of the three year period? Though the integrated approach may afford useful starting points for the learning of the 3Rs, a mastery of these subjects, which is the indispensable foundation for future work, can only be obtained through regular and systematic practice with a single aim in mind. However, it would require a high degree of skill and experience, if the teacher were to use the integrated approach exclusively and also ensure that the necessary ground in each subject will be fully covered. In planning a curriculum for the lower primary schools, the importance of continuing on to upper primary and ultimately to secondary school must be kept in view.

In this respect, it should be pointed out that certain changes have already been introduced in the project which will be taken into account when it is generalised. During the early stage of experimentation the "centre of interest" approach was adopted in which total integration of subjects in the curriculum was tried out at the laboratory schools. This resulted in the neglect of certain concepts and skills particularly those pertaining to the 3Rs. The project then changed its strategy to the "thematic approach" when there is only partial integration of subjects limited to Elementary Science, Local Studies, Health, and Art and Craft. In the attempt to encourage teachers to adopt the thematic approach, the project suggested group teaching in stages, the first stage for one subject only, the second integrating two subjects and the third integrating three subjects. In order to help pupils master the 3Rs, the project suggested that Arithmetic and the Malay Language be taught in the first and second

stage of group work. Skills in Arithmetic and the Malay Language would be strengthened according to the suitability of the theme being taught.

It has been argued that this project is a response to the never-ending requests by pressure groups to add more to the already overloaded school curriculum. However, curricular integration can be done without sacrificing common content. It can also eliminate duplication, overlapping and compartmentalisation. The project therefore has great potential for generalization.

However, it has also brought forth the following problems:

(a) time-tabling, e.g. instead of 30 minutes for each of the four subject, there is now a period of 80 to 120 minutes for different activities involving the four subjects of the integrated curriculum (see example, Figure 5);

(b) classroom arrangement and organisation will have to be reviewed, e.g. type of furniture and seating arrangement, storage facilities and space, larger and better equipped classrooms will have to be made available (see Figure 6);

(c) strategies for teaching and learning, e.g. material-based band activities-oriented. The teacher's role becomes highly professional and involves very efficient classroom management.

6. Methods used to monitor implementation of the reform

The innovation while at the pilot stage was continuously evaluated to provide feedback for decision-making concerning its appropriateness and effectiveness.

Consideration has also been given to carrying out a summative evaluation in 1981.

The planning stage itself was evaluated by obtaining the relevant opinions and judgements of experts on the following:

(a) whether the objectives are related to the goals;

(b) whether these objectives are attainable at the three stages of education for which the curriculum is being developed; and

(c) whether the processes for arriving at curricular objectives are adequate.

Figure 5. National Primary School, Neserah, Kuantan, Pahang

Time Table for Grade 1R - Year 1980

Name of teacher: Mrs. H.Y.W.

Time / Day	12.30	1.00	1.30	2.00	2.30	3.00	3.50	4.20	4.50	5.50	6.20
Monday	...	English		Arithmetic	Malay language		Religious knowledge	English		Physical Education	
Tuesday	...	English		Arithmetic	Malay language		Religious knowledge	English	P. EDN	Health	
Wednesday	...	Arithmetic		Malay language	Elem.Science		Art & Craft		Local Studies	P. EDN	
Thursday	...	Arithmetica		Health	Malay language		Elem.Science	Art & Craft		Religious knowledge	
Friday		English		Arithmetic	Malay language		Music	English	P.EDN	" "	

☐ Periods using integrated curriculum

English	10x30	300	Malay Language	10x30	300	Arithmetic	7x30	210	Music	1x30	30
						Elem. science	3x30	90			
						Religious knowledge	4x30	120			
						Art & Craft	4x30	120			
						P. Edn	4x30	120			
						Health	2x30	60			
						Local studies	1x30	30			30
Total		300	Total:		300	Total		750	Total:		
									Grand Total:		1,380

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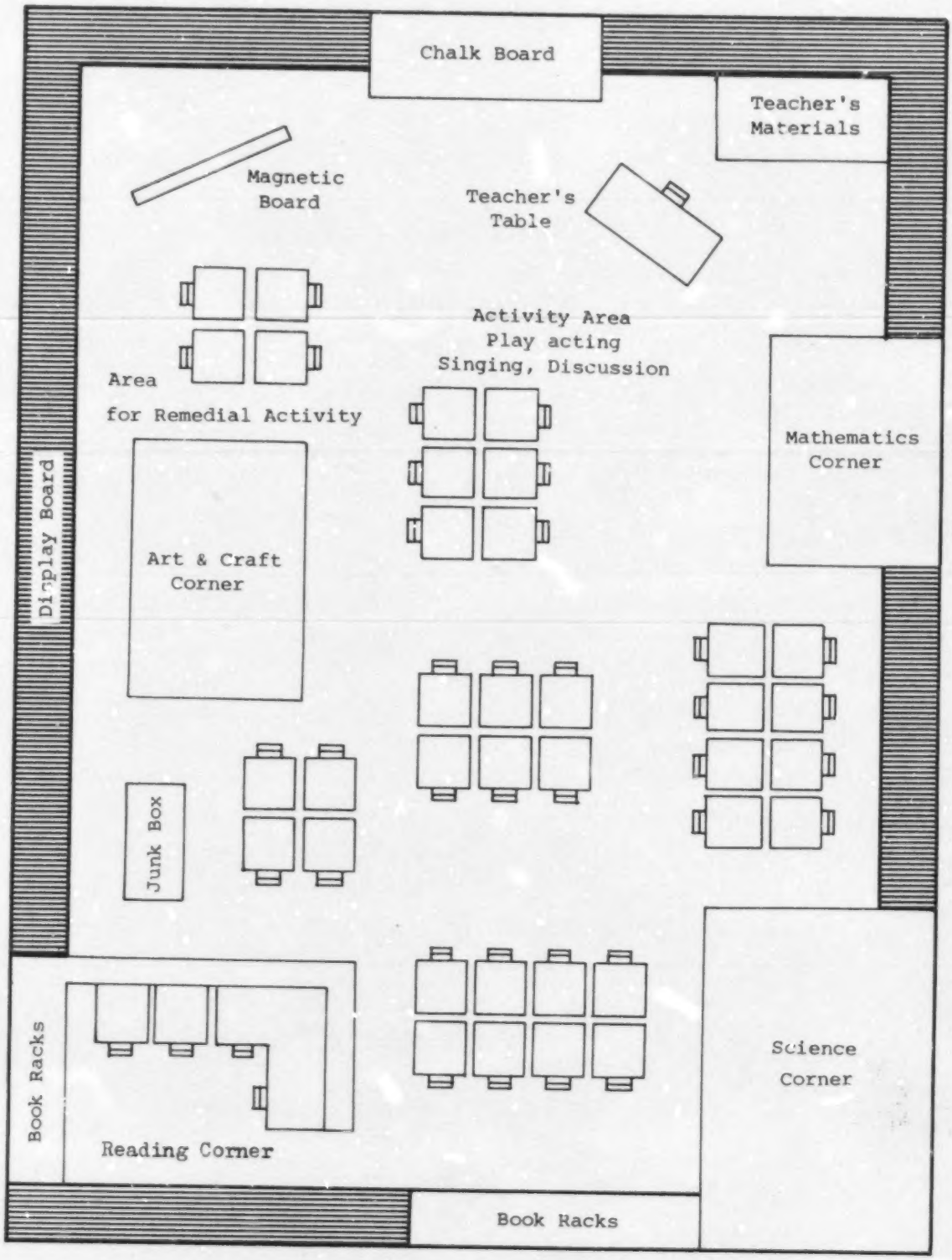
Figure 6. A suggestion for classroom arrangement



Next the prototype instructional materials were evaluated. Data were obtained from teachers in terms of the following criteria:

(a) relevance to objective;

(b) relevance to the pupils and their environment;

(c) content balanced and up-to-date; and

(d) organizational structure of the content.

Formative evaluation was also carried out on the in-service courses given to teachers and headmasters, as well as on pupils' learning achievements. The latter were in the form of tests designed by specialists in the Curriculum Development Centre and the Examinations Syndicate.

The findings of the evaluation were submitted to UNICEF and the Central Curriculum Committee as well as the various agencies of the Ministry of Education.

7. Experience gained

A number of issues and concerns constantly recurred in the course of experimentation of this project.

The general conclusion is that curriculum developers should not work in isolation; they should take into account the views of a wide range of people. It is therefore desirable to establish procedures for working cooperatively with teachers, parents, government agencies, universities, and local school communities.

It was also found that one of the barriers to ensuring effective implementation of the new curriculum was the lack of understanding among teachers regarding the curriculum, and its implications for the teaching-learning situation. The in-service training programme seems to have very little effect in removing this constraint. It is therefore felt that field supervision and inspection on a large scale should be maintained. Regular communication between schools and the organisers of curriculum innovation should take place.

However, most important of all there emerged in the Cabinet Committee Report on Education (1979) specific recommendations which have far-reaching consequences for the primary school curriculum. The Report recommended:

(a) the Ministry of Education should take specific steps to ensure that education at the primary level emphasises the 3Rs, that is, Reading, Writing, Arithmetic;

(b) Curriculum for basic education should be skill-based rather than subject-based. These skills should be achieved through their respective subjects without shortening the time allocated as is currently the practice;

(c) it is recommended that automatic promotion as practised be continued. However, students who are weak in specific areas should be given systematic remedial teaching; and for those who are extremely weak generally, provisions should be made to enable them to repeat the year of study. It is felt that such a stop will not run counter to the principle of automatic promotion because in general nearly all pupils will be promoted each year;

(d) in view of the inadequacies and shortcomings with regard to the implementation of remedial teaching, the Cabinet Committee recommended that the Criterion Reference Tests (CRT), should be introduced on a wider scale. When work on the CRT is completed these tests should replace the Grade Three Diagnostic Tests and the Grade Five Assessment Tests; and

(e) it is also recommended that remedial teaching be properly examined and improved. Among others, these measures should include new methods of teaching, appropriate teaching materials, smaller class size, provision of teachers for remedial work and the use of specific materials.

The recommendations of the Cabinet Committee Report on Education, 173 in all, cover the whole spectrum of the education system in Malaysia, including Curriculum, Management, School Discipline, Educational Facilities and Procurement of Supplies. These recommendations have been accepted by the Government and it is incumbent upon the Minsitry of Education to implement them.

In conclusion, though the curricular reform project has substantiated that children's learning is greatly enhanced when the learning process is informal, when individual and group activities are blended together, when teachers play less of a prescriptive role and more of a facilitative one,

and that the integrated approach avoids the duplication of topics, thus making the learning process a natural and more importantly a meaningful one, careful consideration will have to be given to it and to administration before the project can be generalized on a nation-wide scale.

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